D-Link®
Building Networks for People

DGS-1500-20/28/52/28P

Web UI Reference Guide SmartPro Switch

Ver. 2.11

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About This Guide

This guide provides instructions to install the D-Link Gigabit SmartPro Switch DGS-1500-20/28/28P/52, how to use the SmartConsole Utility, and to configure Web-based Management step-by-step.

Note: The model you have purchased may appear slightly different from the illustrations shown in the document. Refer to the Product Instruction and Technical Specification sections for detailed information about your switch, its components, network connections, and technical specifications.

This guide is mainly divided into four parts:

1. Hardware Installation: Step-by-step hardware installation procedures.
2. Getting Started: A startup guide for basic switch installation and settings.
3. Smart Console Utility: An introduction to the central management system.
4. Configuration: Information about the function descriptions and configuration settings.

Terms/Usage

In this guide, the term “Switch” (first letter capitalized) refers to the SmartPro Switch, and “switch” (first letter lower case) refers to other Ethernet switches. Some technologies refer to terms “switch”, “bridge” and “switching hubs” interchangeably, and both are commonly accepted for Ethernet switches.

A **NOTE** indicates important information that helps a better use of the device.

A **CAUTION** indicates potential property damage or personal injury.

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1 Product Introduction

Thank you and congratulations on your purchase of D-Link SmartPro Switch Products.

D-Link's next generation SmartPro Ethernet switch series blends plug-and-play simplicity with exceptional value and reliability for small and medium-sized business (SMB) networking. All models are housed in a new style rack-mount metal case with easy-to-view front panel diagnostic LEDs, and provides advance features including four 1000BASE-X SFP slots for fiber connection, network security, traffic segmentation, QoS and versatile management.

Flexible Port Configurations. Four port densities are available for selection: 16, 24, and 48 Gigabit Ethernet ports. Supporting auto-detection of MDI/MDIX, these switches bring inexpensive and easy Ethernet connection to the desktops. DGS-1500 series provides 4 SFP slots, which supports 1000M fiber connections with appropriate fiber transceivers. DGS-1500-28P provides 4 combo SFP slots, which supports both 1000M and 100M fiber connections with appropriate fiber transceivers. The first 24 ports also support up to 15.4 or 30 watts PoE power for the connections of wireless access points, IP phones and other PoE-supported devices, allowing them to be deployed at difficult places such as on high walls and ceilings, where AC power outlets are not readily available.

D-Link Green Technology. D-Link Green devices are about providing eco-friendly alternatives without compromising performance. D-Link Green Technology includes a number of innovations to reduce energy consumption on DGS-1500 series such as reducing power when a port does not have a device attached, or adjusting the power usage according to the Ethernet cable connected to it. For PoE model such as DGS-1500-28P, D-Link Green Technology offers Time-based PoE feature to shut down per port power off working hours.

Extensive Layer 2 Features. Implemented as complete L2 devices, these switches include functions such as IGMP snooping, port mirroring, Spanning Tree, 802.3ad LACP, SNTP, LLDP and Loopback Detection to enhance performance and network resiliency.

Extensive Layer 3 Features. Implemented as complete L3 devices, these switches include functions such as IP interface, static route, IPv6 Static Route, ARP and single IP management to enhance performance and network resiliency.

QoS. The switches supports bandwidth control and 802.1p priority queues, enabling users to run bandwidth-sensitive applications such as streaming multimedia by prioritizing that traffic in network. These functions allow switches to work seamlessly with VLAN and 802.1p traffic and IPv6 traffic class priority in the network.

Network Security. D-Link's innovative Safeguard Engine function protects the switches against traffic flooding caused by virus attacks. Additional features Storm Control can help to keep the network from being overwhelmed by abnormal traffic. Port Security is another simple but useful authentication method to maintain the network device integrity. Also supports DHCP Server Screening, SSL, SSH and Smart Binding features.

Versatile Management. The new generation of D-Link Web Smart Switches provides growing businesses with a simple and easy management of their network, using an intuitive SmartConsole utility or a Web-Based management interface that allows administrators to remotely control their network down to the port level. The SmartConsole easily allows customers to discover multiple D-Link web smart switches with the same L2 network segment connected to the user's local PC. With this utility, users do not need to change the IP address of the PC and provide easy initial settings of the smart switches. The switches within the same L2 network segment connected to the user's local PC are displayed on the screen for instant access. It allows extensive switch configuration settings, and basic configuration of discovered devices, such as a password change or firmware upgrade.

Users can also access the switch via TELNET. Some basic tasks can be performed such as changing the Switch IP address, resetting the settings to factory defaults, setting the administrator password, rebooting the Switch, or upgrading the Switch firmware by using the Command Line Interface (CLI).

In addition, users can utilize the SNMP MIB (*Management Information Base*) to poll the switches for information about the status, or send out traps of abnormal events. SNMP support allows users to integrate the switches with other third-party devices for management in an SNMP-enabled environment. D-Link Web Smart Switches also come with the D-View plug-in module that works with D-View 6 SNMP Management Software, and provides easy-to-use graphic interface and facilitates the operation efficiency.

DGS-1500-20

16-Port 10/100/1000Mbps plus 4 1000Base-T/SFP ports SmartPro Switch.

Front Panel

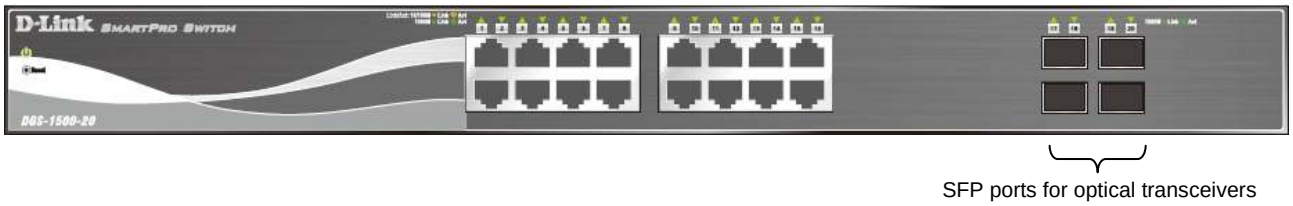


Figure 1.1 – DGS-1500-20 Front Panel

Power LED : The Power LED lights up when the Switch is connected to a power source.

Reset: By pressing the Reset button, the Switch will change back to the default configuration and all changes will be lost.

Port Link/Act/Speed LED (1-16, 17F, 18F, 19F, 20F): The port LEDs indicate a network link through the corresponding port. Blinking indicates the Switch is either sending or receiving data to the port. When the port LED glows in amber, it indicates the port is running on 10M or 100M. When the port LED glows in green, it is running on 1000Mbps.

CAUTION: The MiniGBIC ports should use UL listed Optical Transceiver product, Rated Laser Class I. 3.3Vdc

Rear Panel

Figure 1.2 – DGS-1500-20 Rear Panel

Power: The power port is where to connect the AC power cord.

DGS-1500-28

24-Port 10/100/1000Mbps plus 4 1000Base-T/SFP ports SmartPro Switch.

Front Panel

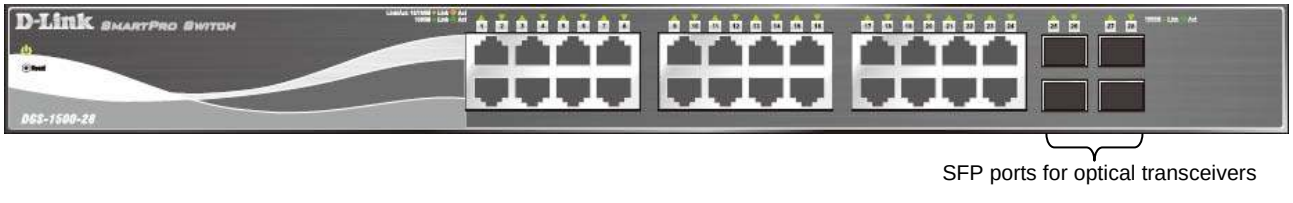


Figure 1.3 – DGS-1500-28 Front Panel

Power LED: The Power LED lights up when the Switch is connected to a power source.

Port Link/Act/Speed LED (1-24, 25F, 26F, 27F, 28F): The Link/Act/Speed LED flashes, which indicates a network link through the corresponding port. Blinking indicates that the Switch is either sending or receiving data to the port. When a port has an amber light, this indicates that the port is running on 10M or 100M. When it has a green light it is running on 1000M.

CAUTION: The MiniGBIC ports should use UL listed Optical Transceiver product, Rated Laser Class I. 3.3Vdc.

Reset: By pressing the Reset button, the Switch will change back to the default configuration and all changes will be lost.

Rear Panel

Figure 1.4 – DGS-1500-28 Rear Panel

Power: The power port is where to connect the AC power cord.

DGS-1500-28P

24-Port 10/100/1000Mbps plus 4 1000Base-T/SFP ports SmartPro PoE Switch.

Front Panel

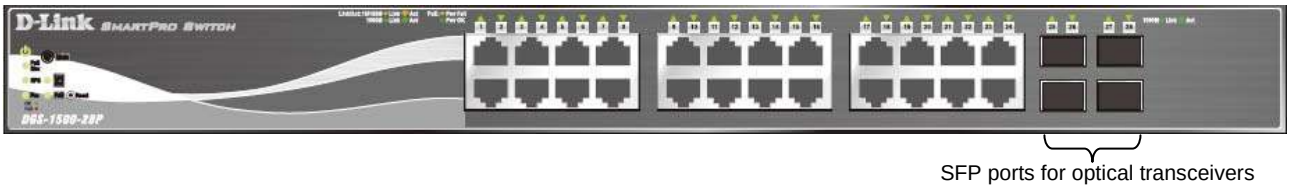


Figure 1.5 – DGS-1500-28P Front Panel

Power LED: The Power LED lights up when the Switch is connected to a power source.

Pwr Max: The Pwr Max LED lights up when the Switch reaches the maximum power budget defined by the administrator via PoE System Settings page of Web GUI or the default power budget of 78 Watts.

Reset: By pressing the Reset button, the Switch will change back to the default configuration and all changes will be lost.

Mode: By pressing the Mode button, the Port LED will switch between Link/Act and PoE modes.

Port Link/Act/Speed LED (1-24, 25F, 26F, 27F, 28F): The Link/Act/Speed LED flashes, which indicates a network link through the corresponding port. Blinking indicates that the Switch is either sending or receiving data to the port. When a port has an amber light, this indicates that the port is running on 10M or 100M. When it has a green light it is running on 1000Mbps.

Fan: The Fan LED lights green when fans work well, and lights red when fans fail.

NOTE: On DGS-1500-28P, the SFP ports are shared with normal RJ-45 ports 25 to 28. When optical transceiver is inserted to SFP port and link up, the RJ-45 port cannot be used.

CAUTION: The MiniGBIC ports should use UL listed Optical Transceiver product, Rated Laser Class I. 3.3Vdc.

Port PoE LED (1-24): When mode LED lights up in PoE mode, the port LEDs indicate powering status over the corresponding port.

Rear Panel

Figure 1.6 – DGS-1500-28P Rear Panel

Power: The power port is where to connect the AC power cord.

DGS-1500-52

48-Port 10/100/1000Mbps plus 4 100/1000FX SFP Slot SmartPro Switch.

Front Panel

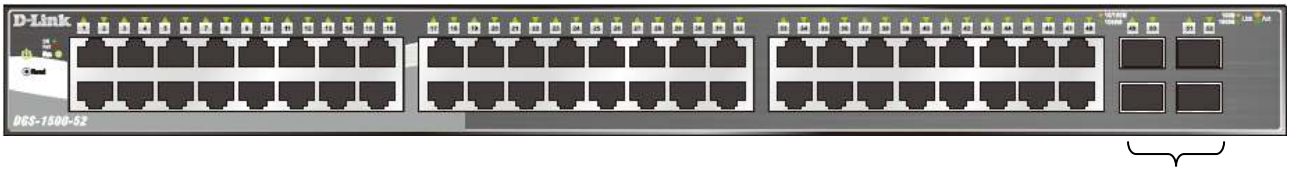


Figure 1.7 – DGS-1500-52 Front Panel

Power LED : The Power LED lights up when the Switch is connected to a power source.

Port Link/Act/Speed LED (1-48, 49F, 50F, 51F, 52F): The Link/Act/Speed LED flashes, which indicates a network link through the corresponding port. Blinking indicates that the Switch is either sending or receiving data to the port. When a port has an amber light, this indicates that the port is running on 10M or 100M. When it has a green light it is running on 1000M.

Fan: The Fan LED lights green when fans work well, and lights red when fans fail.

Reset: Press the Reset button to reset the Switch back to the default settings. All previous changes will be lost.

CAUTION: The MiniGBIC ports should use UL listed Optical Transceiver product, Rated Laser Class I. 3.3Vdc.

Rear Panel

Figure 1.8 – DGS-1500-52 Rear Panel

Power: Connect the supplied AC power cable to this port.

2 Hardware Installation

This chapter provides unpacking and installation information for the D-Link SmartPro Switch.

Step 1: Unpacking

Open the shipping carton and carefully unpack its contents. Please consult the packing list located in the User Manual to make sure all items are present and undamaged. If any item is missing or damaged, please contact your local D-Link reseller for replacement.

- One D-Link SmartPro Switch
- One AC power cord
- Four rubber feet
- Screws and two mounting brackets
- One Multi-lingual Getting Started Guide
- One CD with User Manual, SmartConsole Utility program, and D-View Module

If any item is found missing or damaged, please contact the local reseller for replacement.

Step 2: Switch Installation

For safe switch installation and operation, it is recommended that you:

- Visually inspect the power cord to see that it is secured fully to the AC power connector.
- Make sure that there is proper heat dissipation and adequate ventilation around the switch.
- Do not place heavy objects on the switch.

Desktop or Shelf Installation

When installing the switch on a desktop or shelf, the rubber feet included with the device must be attached on the bottom at each corner of the device's base. Allow enough ventilation space between the device and the objects around it.

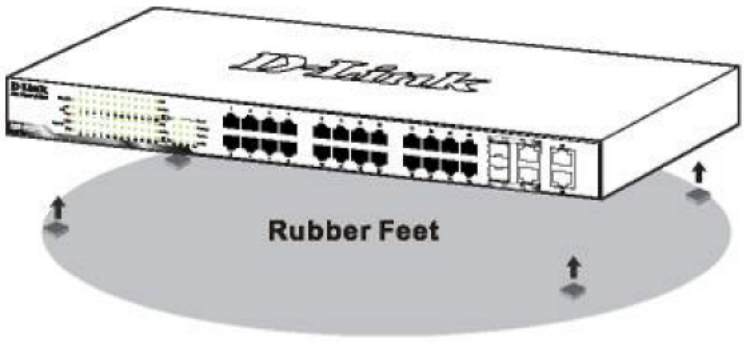


Figure 2.1 – Attach the adhesive rubber pads to the bottom

Rack Installation

The switch can be mounted in an EIA standard size 19-inch rack, which can be placed in a wiring closet with other equipment. To install, attach the mounting brackets to the switch's side panels (one on each side) and secure them with the screws provided (with 8 M3*6.0 size screws).

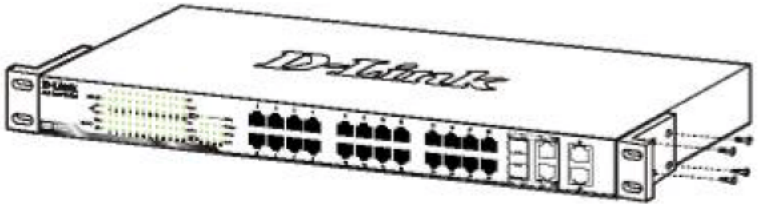


Figure 2.2 – Attach the mounting brackets to the Switch

Then, use the screws provided with the equipment rack to mount the switch in the rack.

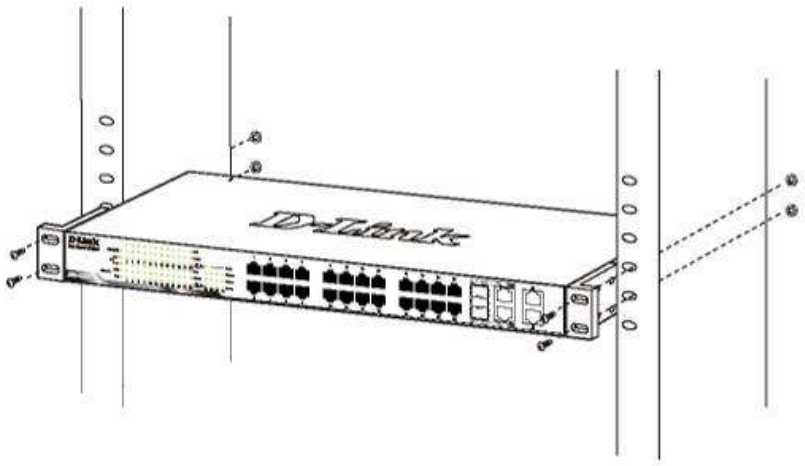


Figure 2.3 – Mount the Switch in the rack or chassis

Please be aware of following safety Instructions when installing:

A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit, and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

Step 3 – Plugging in the AC Power Cord

Users may now connect the AC power cord into the rear of the switch and to an electrical outlet (preferably one that is grounded and surge protected).

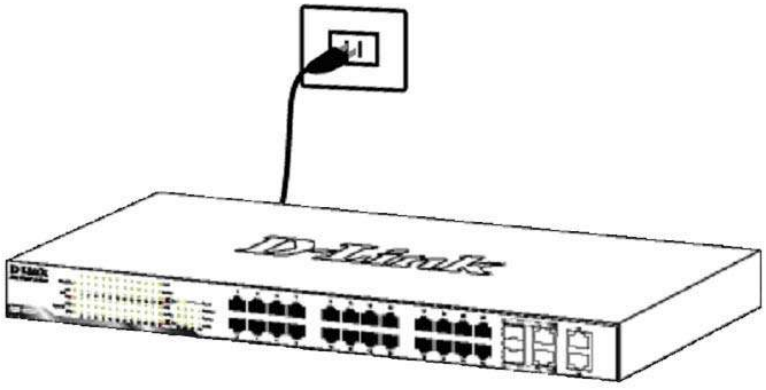


Figure 2.4 –Plugging the switch into an outlet

Power Failure

As a precaution, the switch should be unplugged in case of power failure. When power is resumed, plug the switch back in.

3 Getting Started

This chapter introduces the management interface of D-Link SmartPro Switch.

Management Options

The D-Link SmartPro Switch can be managed through any port on the device by using the Web-based Management, or through any PC using the SmartConsole Utility or CLI commands.

Each switch must be assigned its own IP Address, which is used for communication with the Web-Based Management or a SNMP network manager. The PC should have an IP address in the same range as the switch. Each switch can allow up to four users to access the Web-Based Management concurrently.

However, if you want to manage multiple D-Link SmartPro Switches, the SmartConsole Utility and Single IP Management are more convenient choice. By using the SmartConsole Utility, you do not need to change the IP address of your PC and it is easier to initialize multiple Smart Switches.

Please refer to the following installation instructions for the Web-based Management and the SmartConsole Utility.

Using Web-based Management

After a successful physical installation, you can configure the Switch, monitor the network status, and display statistics using a web browser.

Supported Web Browsers

The embedded Web-based Management currently supports the following web browsers:

- Internet Explorer 6 or later version
- Netscape 8 or later version
- Chrome 5.0 or later version
- Firefox 3.0 or later version
- Opera 10 or later version

Connecting to the Switch

You will need the following equipment to begin the web configuration of your device:

1. A PC with a RJ-45 Ethernet connection
2. A standard Ethernet cable

Connect the Ethernet cable to any of the ports on the front panel of the switch and to the Ethernet port on the PC.

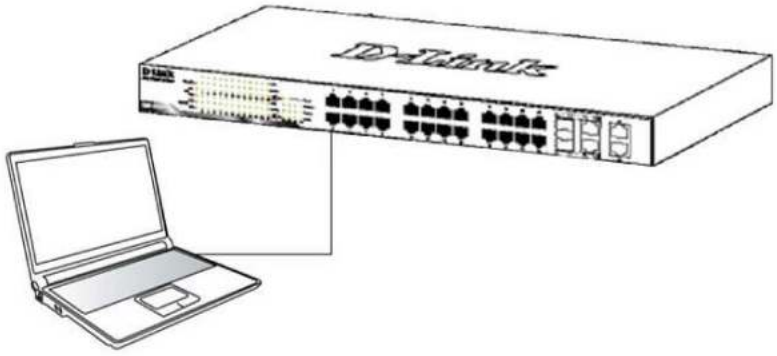


Figure 3.1 – Connected Ethernet cable

Login Web-based Management

In order to login and configure the switch via an Ethernet connection, the PC must have an IP address in the same subnet as the switch. For example, if the switch has an IP address of **10.90.90.90**, the PC should have an IP address of **10.x.y.z** (where x/y is a number between 0 ~ 254 and z is a number between 1 ~ 254), and a subnet mask of **255.0.0.0**. There are two ways to launch the Web-based Management, you may either click the Web Access button at the top of the SmartConsole Utility or open the web browser and enter **10.90.90.90** (the factory-default IP address) in the address bar. Then press <Enter>.

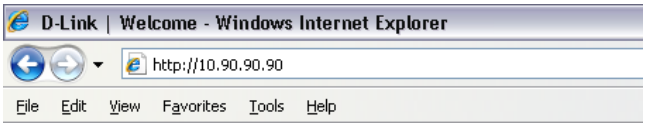


Figure 3.2 –Enter the IP address 10.90.90.90 in the web browser

NOTE: The switch's factory default IP address is 10.90.90.90 with a subnet mask of 255.0.0.0 and a default gateway of 0.0.0.0.

The web configuration can also be accessed through the SmartConsole Utility. Open the SmartConsole Utility and double-click the switch as it appears in the Monitor List. This will automatically load the web configuration in your web browser.

When the following logon dialog box appears, enter the password and choose the language of the Web-based Management interface then click **OK**.

The switch supports 10 languages including English, Traditional Chinese, Simplified Chinese, German, Spanish, French, Italian, Portuguese, Japanese and Russian. By default, the password is **admin** and the language is **English**.

Figure 3.3 – Logon Dialog Box

Smart Wizard

After a successful login, the Smart Wizard will guide you through essential settings of the D-Link Web Smart Switch. Please refer to the Smart Wizard Configuration section for details.

Web-based Management

By clicking the **Exit** button in the Smart Wizard, you will enter the Web-based Management interface. Please refer to Chapter 5 Configuration for detailed instructions.

SmartConsole Utility

The SmartConsole Utility included in the installation CD is a program for discovering D-Link Smart Switches within the same network segment connected to your PC. This tool is only for computers running Windows 2000, Windows XP, Windows 7, or Windows Vista operating systems. There are two options for the installation of the SmartConsole Utility; one is through the autorun program on the installation CD and the other is manual installation.

NOTE: Please be sure to uninstall any existing SmartConsole Utility from your PC before installing the latest SmartConsole Utility.

Option 1: Follow these steps to install the SmartConsole Utility via the autorun program on the installation CD.

1. Insert the Utility CD into your CD-Rom/DVD-Rom Drive.
2. The autorun program will appear automatically.
3. Click on the ”Install SmartConsole Utility” button and an installation wizard will guide you through the process.
4. After successfully installing the SmartConsole Utility, you can open the utility by clicking Start > Programs > D-Link SmartConsole Utility.
5. Connect the Smart Switch to the same L2 network segment of your PC and use the SmartConsole Utility to discover the Smart Switches.

Option 2: Follow these steps to install the SmartConsole Utility manually.

1. Insert the Utility CD into your CD-Rom/DVD-Rom Drive.
2. From the Start menu on the Windows desktop, click Run.
3. In the **Run** dialog box, type D:\D-Link SmartConsole Utility\D-Link_SmartConsole_Utility_v3.00.10.exe (where D:\ represents the drive letter of your CD-Rom) and click **OK**.
4. Follow the on-screen instructions to install the utility.
5. Upon completion, go to Start > Programs > D-Link SmartConsole Utility and open the SmartConsole Utility.
6. Connect the Smart Switch to the same L2 network segment of your PC and use the SmartConsole Utility to discover the Smart Switches.

For detailed explanations of SmartConsole’s functions, please refer to Chapter 4 *SmartConsole Utility*

NOTE: The current SmartConsole Utility does not support IPv6 feature. Please be sure to install the SmartConsole Utility from you PC with IPv4 address. After installed SmartConsole Utility, then it can discover the DGS-1500 series with IPv6 address.

4 SmartConsole Utility

The D-Link SmartConsole Utility allows the administrator to quickly discover all D-Link smart switches, which are in the same domain of the PC, collect traps and log messages, and quick access to basic configurations of the switch.

The SmartConsole Utility consists of three parts, **Device Configurations** at the top, **Device List** as the main body, and **SmartConsole Settings** at the left.

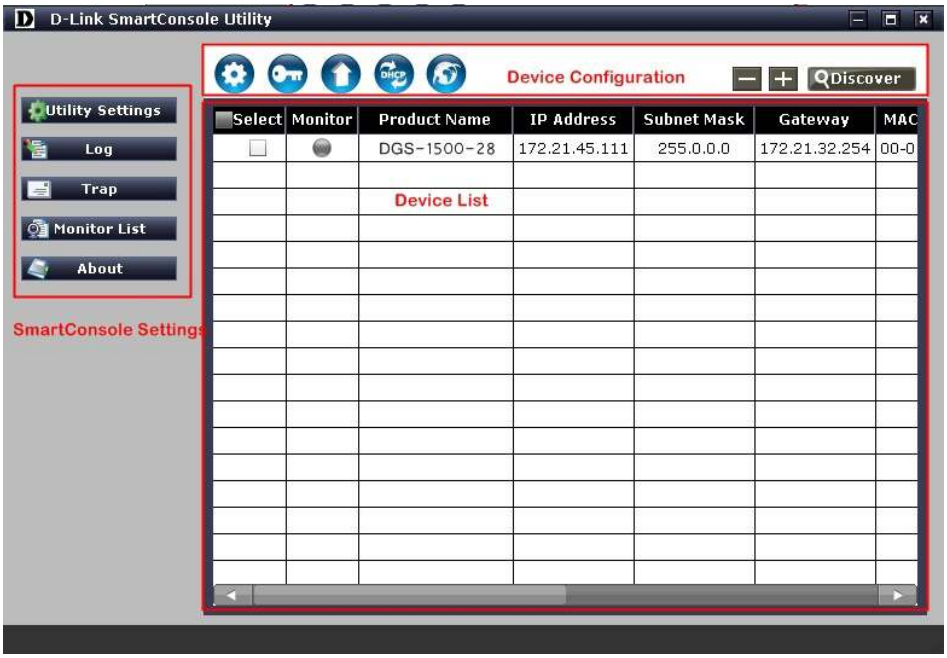


Figure 4.1 – SmartConsole Utility

SmartConsole Settings

The SmartConsole Settings at the left has five icons, **Utility Settings**, **Log**, **Trap**, **Monitor list**, and **About**.

Utility Settings

Click this icon to launch the Utility Settings window. **Refresh time** refreshes the devices, which were selected as monitored devices in the Device List. Choices include **15 secs, 30 secs, 1 mins, 2 mins,** and **5 mins** for selecting the monitoring time intervals. **Utility Group Interval** establishes the intervals (in seconds) that the Switch will be discovered in the SmartConsole Device List.

Figure 4.2 – SmartConsole Utility Settings

NOTE: If the Group Interval is set to 0, IGMP Snooping must be disabled in the Switch, or the SmartPro Switch will not be discovered.

Log

Click this icon to launch the Log window. Click **View Log** to show the events of the SmartConsole Utility and the device. **Time** indicates when the message was received, Location indicates where the message was

received and **IP Address** denotes where it comes from. Click **Refresh** to redisplay all log entries, click **Clear** to clear all log entries. Click **Exit** to exit.

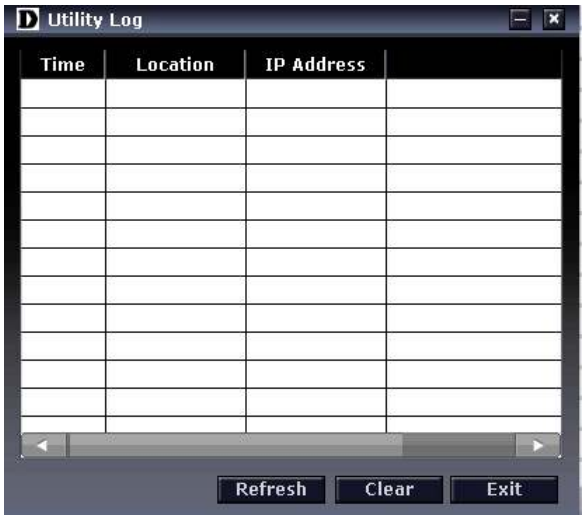


Figure 4.3 – SmartConsole Log

Trap

Click this icon to launch the Trap window. Click **View Trap** to show the events of the SmartConsole Utility and the device. **Time** indicates when the trap message was received, **Location** indicates where the trap message was received, **IP** denotes where it comes from and **Event** shows the content of this trap message. Click **Refresh** to redisplay all traps, click **Clear** to clear all entries. Click **Exit** to exit

Figure 4.4 – SmartConsole Trap

The trap icon in the SmartConsole Settings will change while receiving new trap messages. Please see below for detailed description.

Icon	Description
	No new traps
	New traps was received

Monitor List

By clicking on this icon you will see below options:

Figure 4.5 – SmartConsole Monitor List

Save: Records the setting of the Device List as default for the next time the SmartConsole Utility is used.
Save As: Records the setting of the Device List in an appointed filename and file path.
Restore: Manually reload a Device List setting file.

About

Click this icon to launch the SmartConsole Info window.

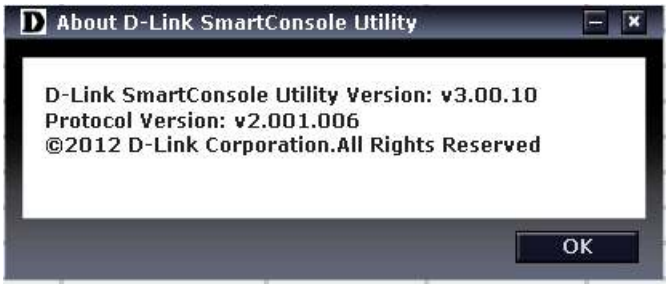


Figure 4.6 – SmartConsole About

Device Configuration

The Device Configuration in the SmartConsole Utility has five icons:

Device Settings

Password Settings

Firmware Upgrade

DHCP Refresh

Web Access

and the , , Discover device buttons for the Device List.

Device Settings

Select a switch from the Device List. Click on this icon to launch the Device Settings window. Here you can configure the Product Name, MAC Address, IPv4 Address, Subnet Mask, Gateway, System Name, Location, Trap IP, Group Interval, and DHCP Client Setting of the Switch.

To apply the configuration, insert the correct device password in the Confirm Password box and then click **OK.**

Figure 4.7 – SmartConsole Device Settings

Password Settings

Select a switch from the Device List. Click on this icon to launch the Device Password Manager window. Here you can enter a new password and confirm it.

Figure 4.8 – SmartConsole Password Settings

Firmware Upgrade

Select one or many switches of the same model name from the Device List. Click on this icon to launch the Firmware Upgrade window. Specify the Firmware Path (or Browse for one) that you are going to use. Input the correct password of the device, and then click **Upgrade.** The state will show "OK" after completion, or “Fail” if the firmware upgrade fails or cannot be completed for any reason.

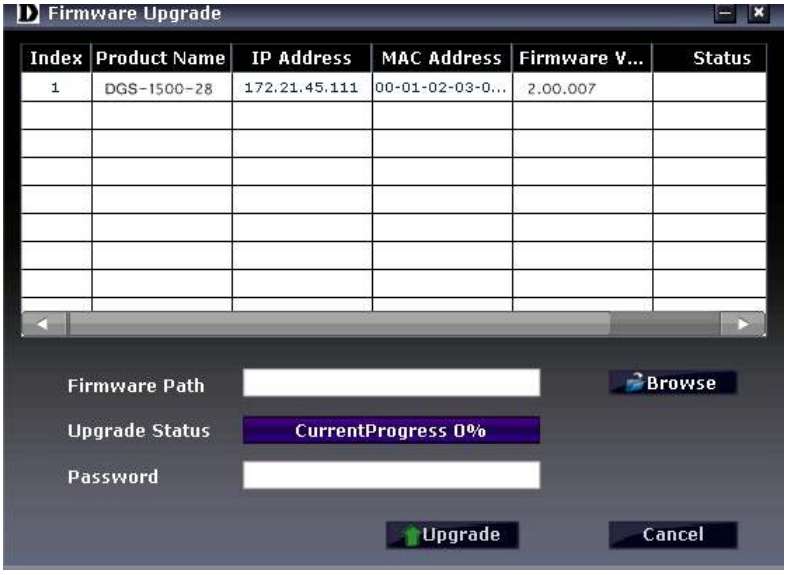


Figure 4.9 – Firmware Upgrade

CAUTION: Do not disconnect the PC or remove the power cord from the device until the upgrade completes. The software may be corrupted because of the incomplete firmware upgrade.

DHCP Refresh:

If a DHCP-client enabled switch in the Device List shows the default IP is still used, it means the device did not receive an IPv4 address from the DHCP server successfully. Select that switch and click the DHCP refresh icon. Enter the correct Device Password and then click **OK.** The device will renew the IPv4 address from the DHCP server.

Refresh IP address from DHCP Server
Please input the device password in order to obtain a new IP address from DHCP server.
Device Password
OK
Cancel

Figure 4.10 – DHCP Refresh

Web Access

Select a switch from the Device List. Click this icon to launch your Internet browser (eg. The Internet Explorer). Here you can configure the Switch through the Web-based Management utility. You may also get into the Web-based Management by double-clicking the device in the device list.

Add(+), Delete(-) and Discover the device

Click the **Discovery** button to display all of the Web-Smart devices located in the same domain with the management PC.

Click the **+** and insert a device IP address to add a device into the Discover List, or select a device and click the **–** button to remove it.

Figure 4.11 – SmartConsole Add device

Figure 4.12 – SmartConsole Delete device

Device List

This list displays all discovered Web-Smart devices on the network.

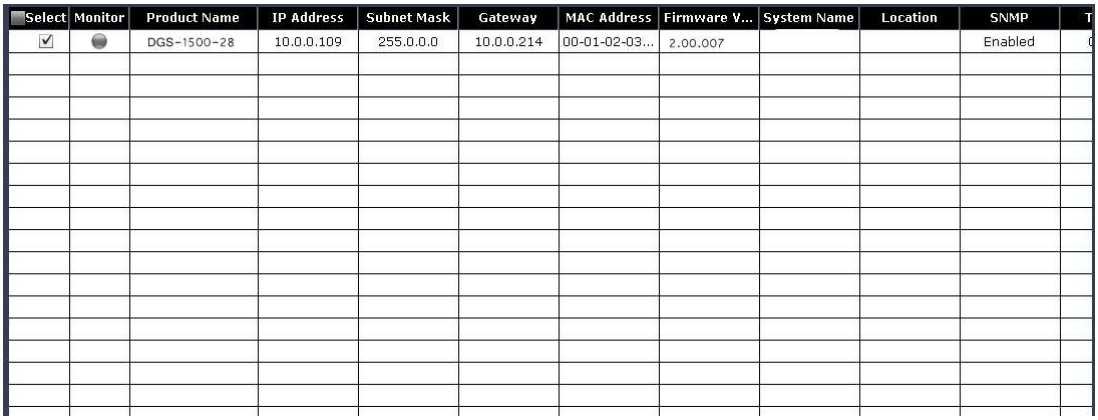


Figure 4.13 – SmartConsole Device List

Definitions of the Device List features:

Select: Click the **Select** to choose a switch for configuration settings.

Monitor: Click the Monitor button and the SmartConsole will collect the trap and log data from the device. The in the monitor means the device was discovered by SmartConsole. Click the icon to have the device to continue updating the information, such as system log or trap to the SmartConsole Utility. The icon will appear . When the device was detected as not reachable, the icon will change to . Please check if the power or the cable of this device is disconnected.

Product Name: Displays the device product name.

IP Address: Displays the current IP addresses of devices.

Subnet Mask: Displays the Subnet Mask setting of the device.

Gateway: Displays the Gateway setting of the device.

MAC Address: Displays the device MAC Addresses.

Firmware version: Displays the current Firmware version of this device.

System Name: Displays the appointed device system name.

Location: Displays the location of the appointed device.

SNMP: Displays the SNMP status of the device.

Trap IP: Displays the IP address of the host where the Trap information will be sent.

DHCP: Specify if the device gets the IP address from a DHCP server.

Group Interval: Displays the intervals (in seconds) that the Switch will be discovered in the SmartConsole Device List.

NOTE: If the devices are marked red in the device list, it means that a firmware upgrade is required again.

NOTE: If the IP address of device is showed with IPv6 address, then it can not be configured with Smartconsole Utility. The user needs to double click the selected device and login the web for configuration.

5 Configuration

The features and functions of the D-Link SmartPro Switch can be configured for optimum use through the Web-based Management Utility.

Smart Wizard Configuration

After a successful login, the Smart Wizard will guide you through essential settings of the D-Link Web Smart Switch. If you do not plan to change anything, click **Exit** to leave the Wizard and enter the Web Interface. You can also skip it by clicking **Don't show Smart Wizard next time** for the next time you logon to the Web-based Management.

IPv4 Information

IPv4 Information will guide you to do basic configurations on 3 steps for the IP Information, access password, and SNMP. Select **Static**, **DHCP** or **BOOTP**, and type the desired new **IP Address**, select the **Netmask** and type the **Gateway** address, then click the **Apply** button to enter the next Password setting page. (No need to enter IP Address, Netmask and Gateway of DHCP and BOOTP selection.) The IP address is allowed for IPv4 and IPv6 address. If you are not changing the settings, click **Exit** button to go back to the main page. Or you can click on Ignore the wizard next time to skip wizard setting when the switch boots up.

Welcome to Smart Wizard
The wizard will guide you to do basic configurations on 3 steps for the IPv4 Information, access password, and SNMP. If you are not changing the settings, click on "Exit" to go back to the main page.
Step 1 of 3: The wizard will help to complete settings for IPv4 address, Netmask, and Gateway.
IPv4 Information
Static
DHCP
BOOTP
IPv4 Address
10.90.90.90
Netmask
8 (255.0.0.0)
Gateway
0.0.0.0
Ignore the wizard next time
Exit
Back
Next

Figure 5.1 – IPv4 Information in Smart Wizard

NOTE: The IPv4 Information of Smart Wizard does not support IPv6 address.

Password Settings

Type the desired new password in the **Password** box and again in the **Confirm Password,** then click the **Next** button to the **SNMP** setting page.

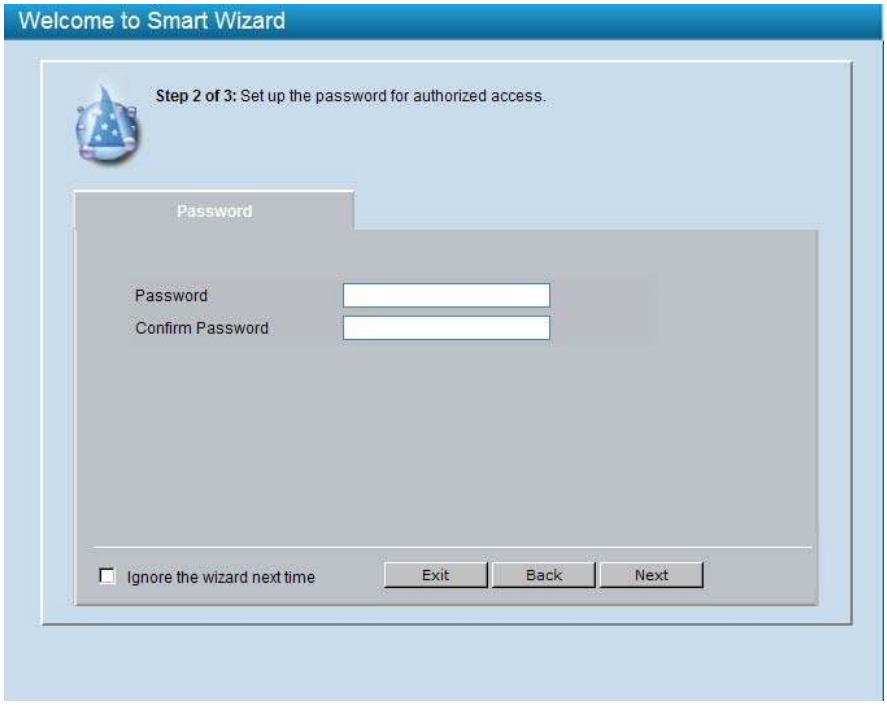


Figure 5.2 – Password setting in Smart Wizard

SNMP Settings

The SNMP Setting allows you to quickly enable/disable the SNMP function. The default SNMP Setting is Disabled. Click **Enabled** and then click **Apply** to make it effective.

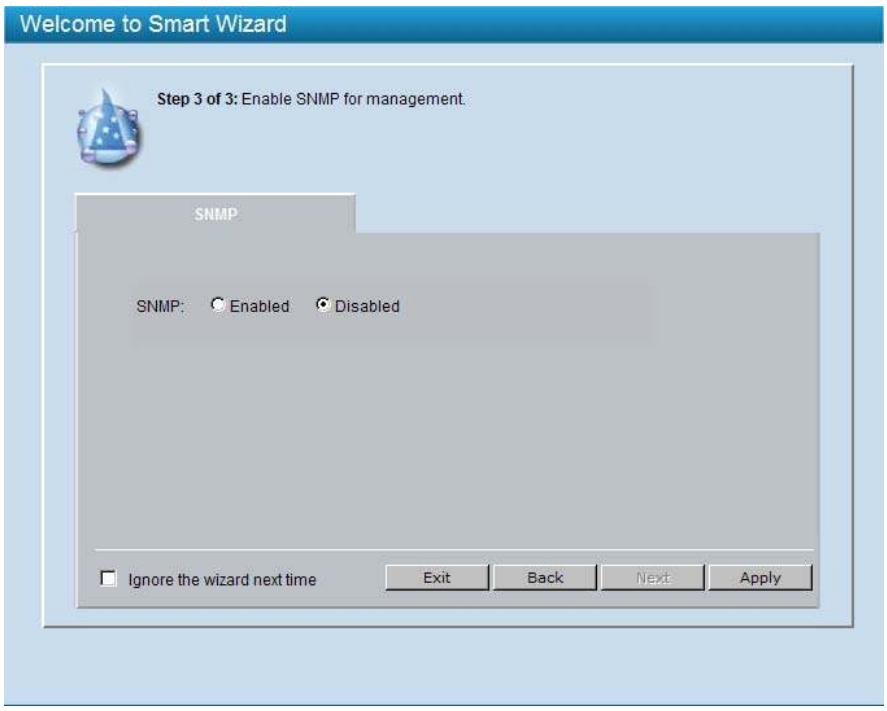


Figure 5.3 – SNMP Setting in Smart Wizard

NOTE: Changing the system IP address will disconnect you from the current connection. Please enter the correct IP address in the Web browser again and make sure your PC is in the same subnet with the switch. See Login Web-based Management for a detailed description.

If you want to change the IP settings, click **OK** and start a new web browser.

Figure 9 – Confirm the changes of IP address in Smart Wizard

Web-based Management

After clicking the **Exit** button in Smart Wizard you will see the screen below:

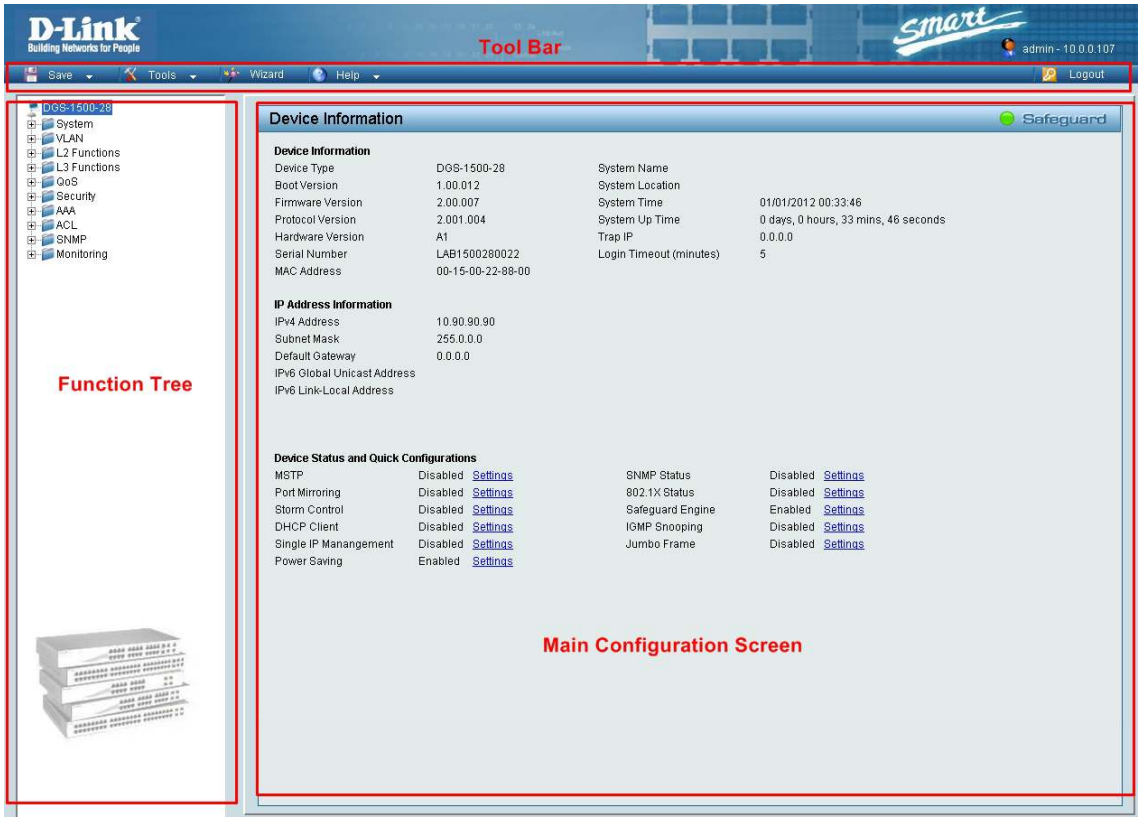


Figure 5.4 – Web-based Management

The above image is the Web-based Management screen. The three main areas are the **Tool Bar** on top, the **Function Tree**, and the **Main Configuration Screen**.

The **Tool Bar** provides a quick and convenient way for essential utility functions like firmware and configuration management.

By choosing different functions in the **Function Tree**, you can change all the settings in the **Main Configuration Screen**. The main configuration screen will show the current status of your Switch by clicking the model name on top of the function tree.

At the upper right corner of the screen the username and current IP address will be displayed.

Under the username is the **Logout** button. Click this to end this session.

NOTE: If you close the web browser without clicking the **Logout** button first, then it will be seen as an abnormal exit and the login session will still be occupied.

Finally, by clicking on the D-Link logo at the upper-left corner of the screen you will be redirected to the local D-Link website.

Tool Bar > Save Menu

The Save Menu provides Save Configuration and Save Log functions.

Figure 5.5 – Save Menu

Save Configuration

Select to save the entire configuration changes you have made to the device to switch's non-volatile RAM.

Figure 5.6 – Save Configuration

Save Log

Save the log entries to your local drive and a pop-up message will prompt you for the file path. You can view or edit the log file by using text editor (e.g. Notepad).

Figure 5.7 – Save Log

Tool Bar > Tool Menu

The Tool Menu offers global function controls such as Reset, Reset System, Reboot Device, Configuration Backup and Restore, Firmware Backup and Upgrade.

Figure 5.8 – Tool Menu

Reset

Provide a safe reset option for the Switch. All configuration settings in non-volatile RAM will be reset to factory default except for the IP address.

Figure 5.9 – Tool Menu > Reset

Reset System

Provide another safe reset option for the Switch. All configuration settings in non-volatile RAM will reset to factory default and the Switch will reboot.

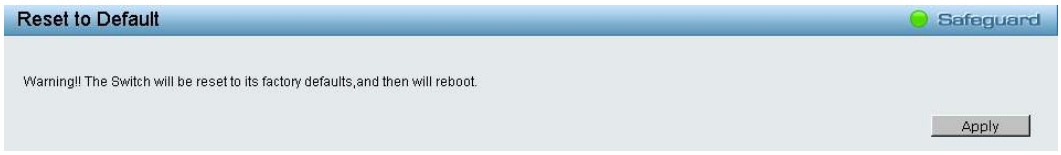


Figure 5.10 – Tool Menu > Reset System

Reboot Device

Provide a safe way to reboot the system. Click **Reboot** to restart the switch.

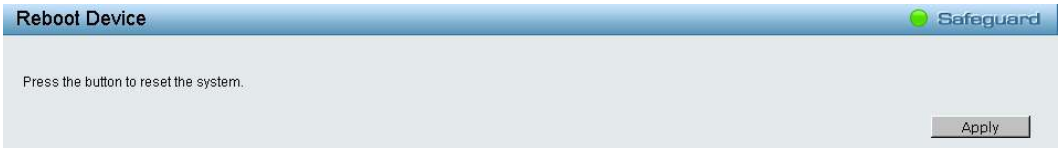


Figure 5.11 – Tool Menu > Reboot Device

Configuration Backup and Restore

Allow the current configuration settings to be saved to a file (not including the password), and if necessary, you can restore configuration settings from this file. Two methods can be selected: **HTTP** or **TFTP**.

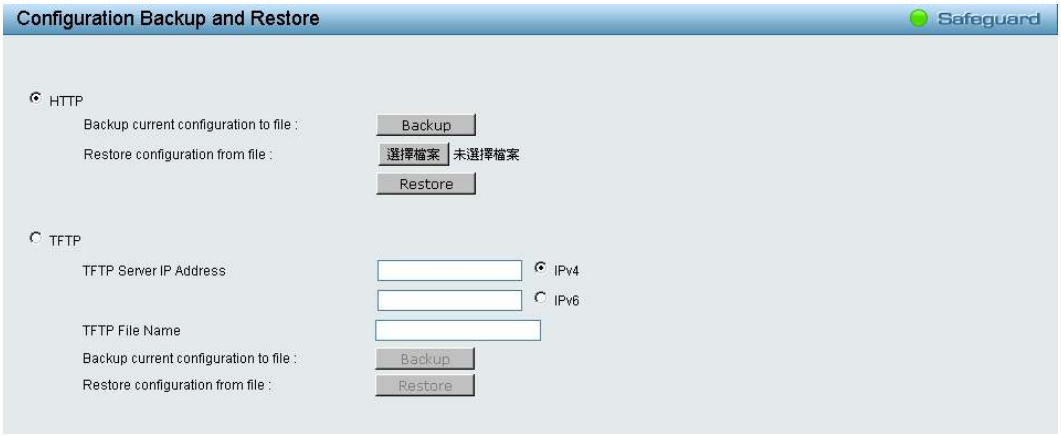


Figure 5.12 – Tool Menu > Configure Backup and Restore

HTTP: Backup or restore the configuration file to or from your local drive.

Click **Backup** to save the current settings to your disk.

Click **Browse** to browse your inventories for a saved backup settings file.

Click **Restore** after selecting the backup settings file you want to restore.

TFTP: TFTP (Trivial File Transfer Protocol) is a file transfer protocol that allows you to transfer files to a remote TFTP server. Select **IPv4** or **IPv6** and specify **TFTP Server IP Address** and **TFTP File Name** for the configuration file you want to save to / restore from. The maximum Telnet Server connection is 4.

Click **Backup** to save the current settings to the TFTP server.

Click **Restore** after selecting the backup settings file you want to restore.

Note: Switch will reboot after restore, and all current configurations will be lost

Firmware Backup and Upgrade

Allow for the firmware to be saved, or for an existing firmware file to be uploaded to the Switch. Two methods can be selected: **HTTP** or **TFTP**.

Figure 5.13 – Tool Menu > Firmware Backup and Upload

HTTP: Backup or upgrade the firmware to or from your local PC drive.

Click **Backup** to save the firmware to your disk.

Click **Browse** to browse your inventories for a saved firmware file.

Click **Upgrade** after selecting the firmware file you want to restore.

TFTP: Backup or upgrade the firmware to or from a remote TFTP server. Select IPv4 or IPv6 and specify **TFTP Server IP Address** and **TFTP File Name** for the configuration file you want to save to / restore from. The maximum Telnet Server connection is 4.

Click **Backup** to save the firmware to the TFTP server.

Click **Upgrade** after selecting the firmware file you want to restore.

CAUTION: Do not disconnect the PC or remove the power cord from device until the upgrade completes. The Switch may crash if the Firmware upgrade is incomplete.

Tool Bar > Smart Wizard

By clicking the Smart Wizard button, you can return to the Smart Wizard if you wish to make any changes there.

Tool Bar > Online Help

The Online Help provides two ways of online support: **Online Support Site** will lead you to the D-Link website where you can find online resources such as updated firmware images; **User Guide** can offer an immediate reference for the feature definition or configuration guide.

Figure 5.14 – Online Help

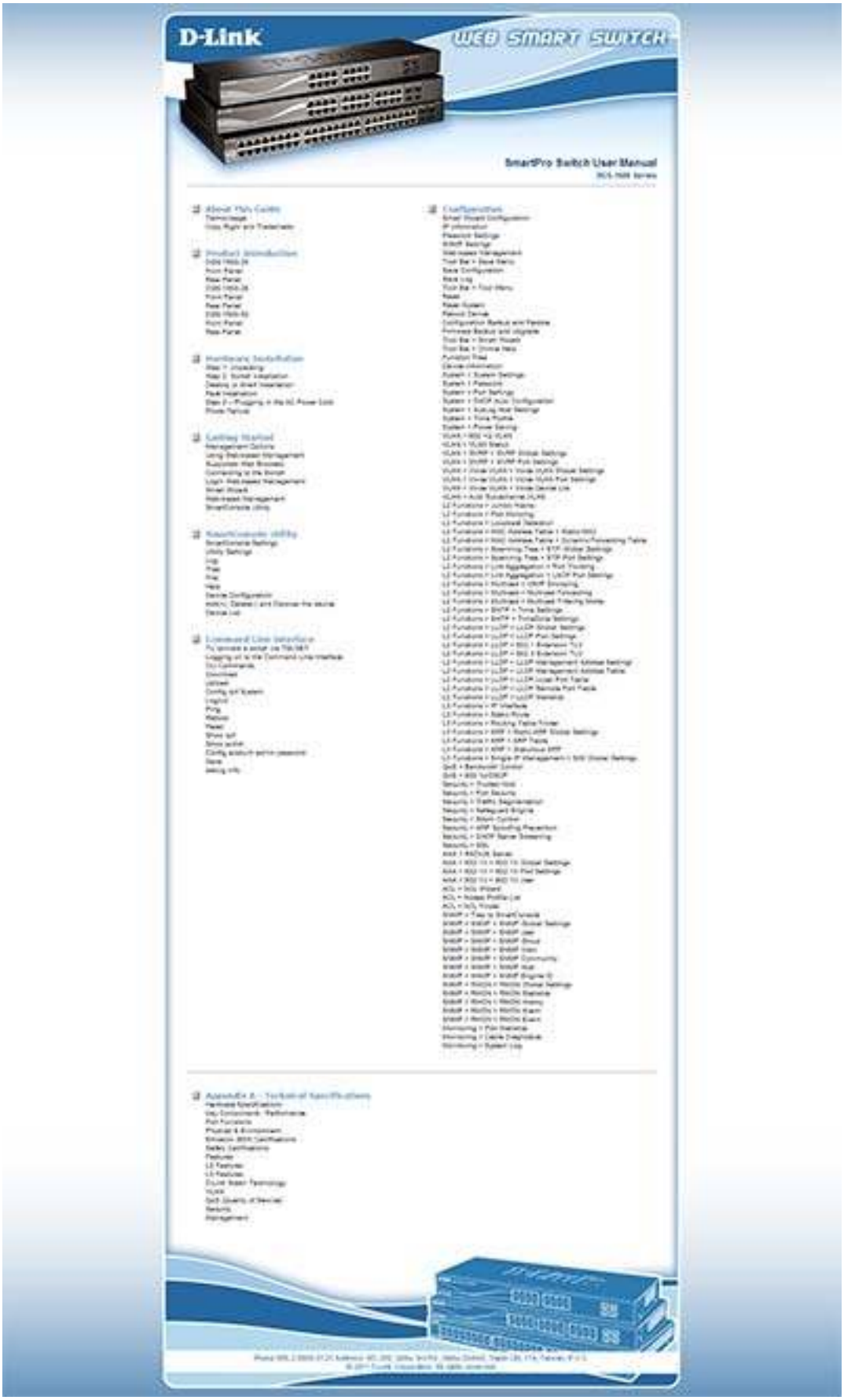


Figure 5.15 – User Guide Micro Site

Function Tree

All configuration options on the switch are accessed through the Setup menu on the left side of the screen. Click on the setup item that you want to configure. The following sections provide more detailed description of each feature and function.

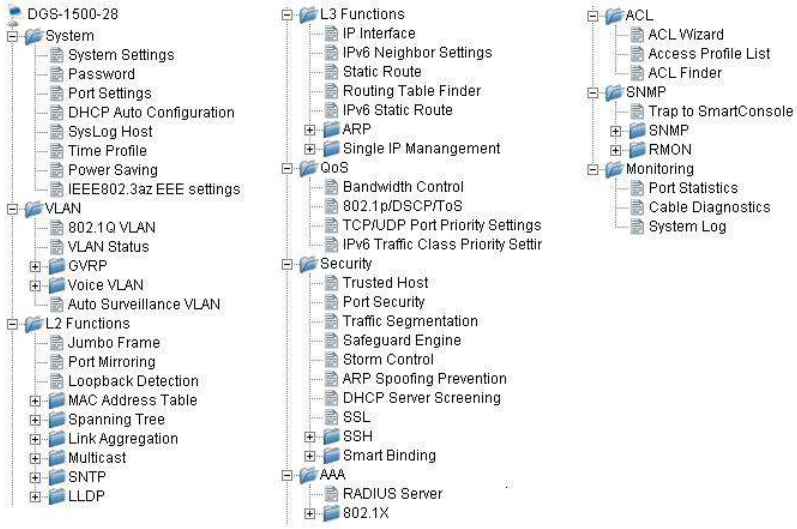


Figure 5.16 –Function Tree

Device Information

The Device Information provides an overview of the switch, including essential information such as firmware & hardware information, and IP address.

It also offers an overall status of common software features:

MSTP: Click **Settings** to link to L2 Functions > Spanning Tree > STP Bridge Global Settings. Default is disabled.

Port Mirroring: Click **Settings** to link to L2 Functions > Port Mirroring. Default is disabled.

Storm Control: Click **Settings** to link to Security > Storm Control. Default is disabled.

DHCP Client: Click **Settings** to link to System > System Settings. Default is disabled.

Single IP Management: Click **Settings** to link to L3 Functions > Single IP Management > SIM Global Settings. Default is disabled.

Power Saving: Click **Settings** to link to System > Power Saving. Default is enabled.

SNMP Status: Click **Settings** to link to SNMP > SNMP > SNMP Global Settings. Default is disabled.

802.1X Status: Click **Settings** to link to AAA > 802.1X > 802.1X Global Settings. Default is disabled.

Safeguard Engine: Click **Settings** to link to Security > Safeguard Engine. Default is enabled.

IGMP Snooping: Click **Settings** to link to L2 Functions > Multicast > IGMP Snooping. Default is disabled.

Jumbo Frame: Click Settings to link to L2 Functions > Jumbo Frame. Default is disabled.

Figure 5.17 – Device Information

System > System Settings

The System Setting allows the user to configure the IP address and the basic system information of the Switch.

IP Information: There are two ways for the switch to obtain an IP address: Static and DHCP (Dynamic Host Configuration Protocol).

When using static mode, the **IP Address**, **Subnet Mask** and **Gateway** can be manually configured. When using DHCP mode, the Switch will first look for a DHCP server to provide it with an IP address (including network mask and default gateway) before using the default or previously entered settings. By default the IP setting is static mode with IP address is **10.90.90.90** and subnet mask is **255.0.0.0**.

System Information: By entering a **System Name** and **System Location**, the device can more easily be recognized through the SmartConsole Utility and from other Web-Smart devices on the LAN.

Login Timeout: The Login Timeout controls the idle time-out period for security purposes, and when there is no action for a specific time span in the Web-based Management. If the current session times out (expires), the user is required a re-login before using the Web-based Management again. Selective range is from 3 to 30 minutes, and the default setting is 5 minutes.

Group Interval: The D-Link Web Smart Switch will routinely send report packets to the SmartConsole Utility in order to maintain the information integrity. The user can adjust the **Group Interval** to optimal frequency. Selective range is from 120 to 1225 seconds, and 0 means disabling the reporting function.

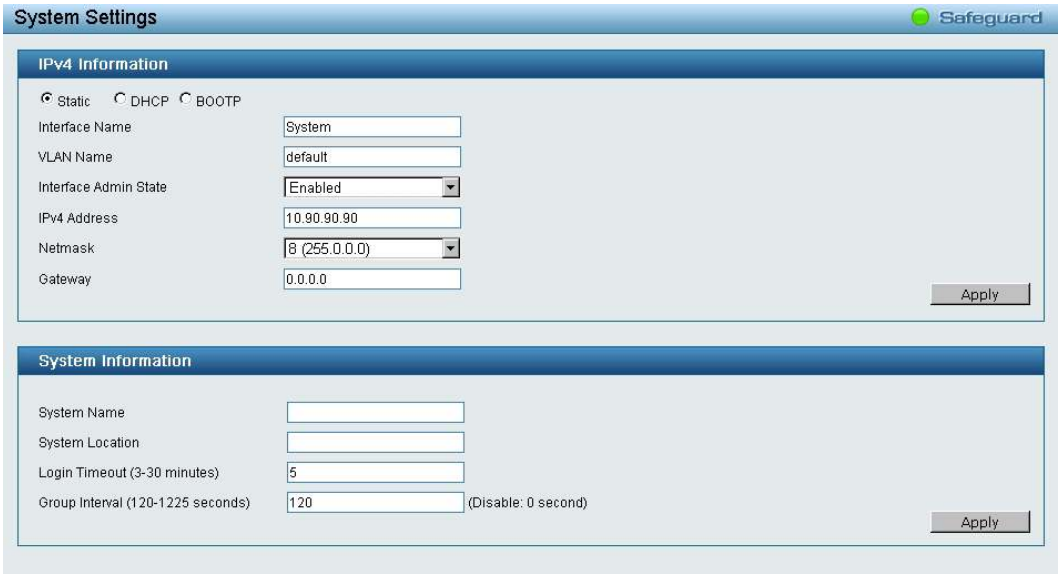


Figure 5.18 – System > System Settings

System > Password

The Password page allows user to change the login password of the device.

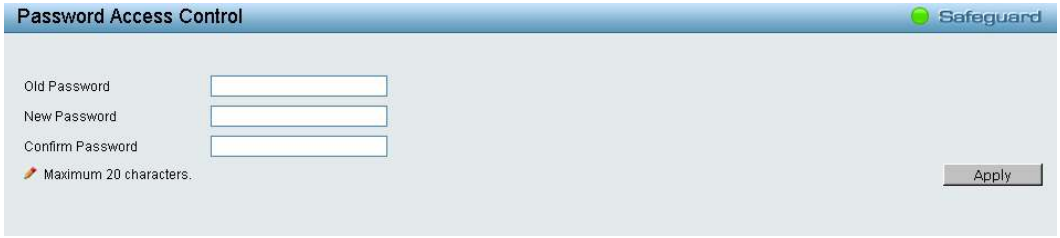


Figure 5.19 – System > Password

To set the Password, set the following parameters and click **Apply**:

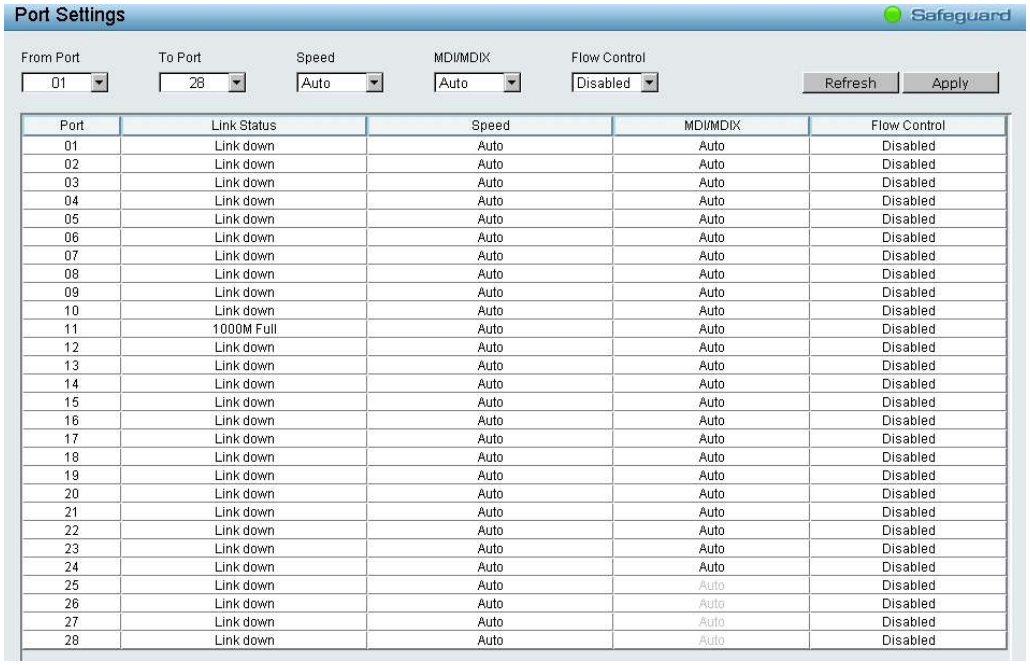
Old Password: If a password was previously configured for this entry, enter it here in order to change it to a new password.

New Password: Enter the new password that you wish to set on the Switch to authenticate users attempting to access Administrator Level privileges on the Switch. The user may set a password of up to 20 characters.

Confirm Password: Confirm the new password entered above. Entering a different password here from the one set in the New Local Enabled field will result in a fail message.

System > Port Settings

In the Port Setting page, the status of all ports can be monitored and adjusted for optimum configuration. By selecting a range of ports (**From Port** and **To Port**), the **Speed** can be set for all selected ports by clicking **Apply**. Press the **Refresh** button to view the latest information.



Port	Link Status	Speed	MDI/MDIX	Flow Control
01	Link down	Auto	Auto	Disabled
02	Link down	Auto	Auto	Disabled
03	Link down	Auto	Auto	Disabled
04	Link down	Auto	Auto	Disabled
05	Link down	Auto	Auto	Disabled
06	Link down	Auto	Auto	Disabled
07	Link down	Auto	Auto	Disabled
08	Link down	Auto	Auto	Disabled
09	Link down	Auto	Auto	Disabled
10	Link down	Auto	Auto	Disabled
11	1000M Full	Auto	Auto	Disabled
12	Link down	Auto	Auto	Disabled
13	Link down	Auto	Auto	Disabled
14	Link down	Auto	Auto	Disabled
15	Link down	Auto	Auto	Disabled
16	Link down	Auto	Auto	Disabled
17	Link down	Auto	Auto	Disabled
18	Link down	Auto	Auto	Disabled
19	Link down	Auto	Auto	Disabled
20	Link down	Auto	Auto	Disabled
21	Link down	Auto	Auto	Disabled
22	Link down	Auto	Auto	Disabled
23	Link down	Auto	Auto	Disabled
24	Link down	Auto	Auto	Disabled
25	Link down	Auto	Auto	Disabled
26	Link down	Auto	Auto	Disabled
27	Link down	Auto	Auto	Disabled
28	Link down	Auto	Auto	Disabled

Figure 5.20 – System > Port Settings

Speed: Gigabit Fiber connections can operate in 1000M Full Force Mode, Auto Mode or Disabled. Copper connections can operate in Forced Mode settings (1000M Full, 100M Full, 100M Half, 10M Full, 10M Half), Auto, or Disabled. The default setting for all ports is **Auto**.

NOTE: Be sure to adjust port speed settings appropriately after changing the connected cable media types.

MDI/MDIX:

A **medium dependent interface** (**MDI**) port is an Ethernet port connection typically used on the Network Interface Card (NIC) or Integrated NIC port on a PC. Switches and hubs usually use **Medium dependent interface crossover (MDIX)** interface. When connecting the Switch to end stations, user have to use straight through Ethernet cables to make sure the Tx/Rx pairs match up properly. When connecting the Switch to other networking devices, a crossover cable must be used.

This switch provides a configurable **MDI/MDIX** function for users. The switches can be set as an MDI port in order to connect to other hubs or switches without an Ethernet crossover cable.

Auto MDI/MDIX is designed on the switch to detect if the connection is backwards, and automatically chooses MDI or MDIX to properly match the connection. The default setting is "**Auto" MDI/MDIX**.

Flow Control: You can enable this function to mitigate the traffic congestion. Ports configured for full-duplex use 802.3x flow control, half-duplex ports use backpressure flow control. The default setting is Disabled.

System > DHCP Auto Configuration

This page allows you to enable the DHCP Auto Configuration feature on the Switch. When enabled, the Switch becomes a DHCP client and gets the configuration file from a TFTP server automatically on next boot up. To accomplish this, the DHCP server must deliver the TFTP server IP address and configuration file name information in the DHCP reply packet. The TFTP server must be up and running and store the necessary configuration file in its base directory when the request is received from the Switch.

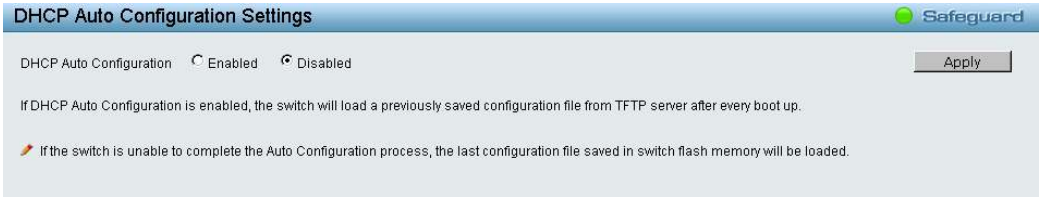

DHCP Auto Configuration Settings
Safeguard
DHCP Auto Configuration
Enabled
Disabled
Apply
If DHCP Auto Configuration is enabled, the switch will load a previously saved configuration file from TFTP server after every boot up.
If the switch is unable to complete the Auto Configuration process, the last configuration file saved in switch flash memory will be loaded.

Figure 5.21 – System > DHCP Auto Configuration

System > SysLog Host Settings

The SysLog Host Settings page allows user to send Syslog messages to up to four designated servers using the **System Log Server**. To set the System Log Server configuration, click **Apply**.

Figure 5.22 – System > SysLog Host Settings

System Log: Enabled or Disabled the SysLog Host feature. It supports maximum 500 system log entries.

Server IP Address: Select IPv4 or IPv6 and specifies the IP address of the system log server.

UDP Port (1 - 65535): Specifies the UDP port to which the server logs are sent. The possible range is *1 – 65535*, and the default value is *514*.

Time Stamp: Select Enable to time stamp log messages.

Severity: Specifies the minimum severity from which warning messages are sent to the server. There are three levels. When a severity level is selected, all severity level choices above the selection are selected automatically. The possible levels are:

Warning - The lowest level of a device warning. The device is functioning, but an operational problem has occurred.

Informational - Provides device information.

All - Displays all levels of system logs.

Facility: Specifies an application from which system logs are sent to the remote server. Only one facility can be assigned to a single server. If a second facility level is assigned, the first facility is overwritten. There are up to eight facilities can be assigned (Local 0 ~ Local 7).

System > Time Profile

The Time Profile page allows users to configure the time profile settings of the device.

Figure 5.23 – System > Time Profile Settings

Profile Name: Specifies the profile name.

Time(HH MM): Specifies the Start Time and End Time.

Weekdays: Specifies the work day.

Date: Select Date and specifies the From Day and To Day of the time profile.

Click **Add** to create a new time profile or click **Delete** to delete a time profile from the table.

NOTE: The time must be set after current time, otherwise it will take effect on the next cycle time.

System > Power Saving

The Power Saving mode feature reduces power consumption automatically when the RJ-45 port is link down or the connected devices are turned off. Less power will be consumed also when the short cable is used (less than 20 meters).

By reducing power consumption, less heat is produced, resulting in extended product life and lower operating costs. By default, the Cable Length Detection and Link Status Detection are enabled. Click **Apply** to make the change effective.

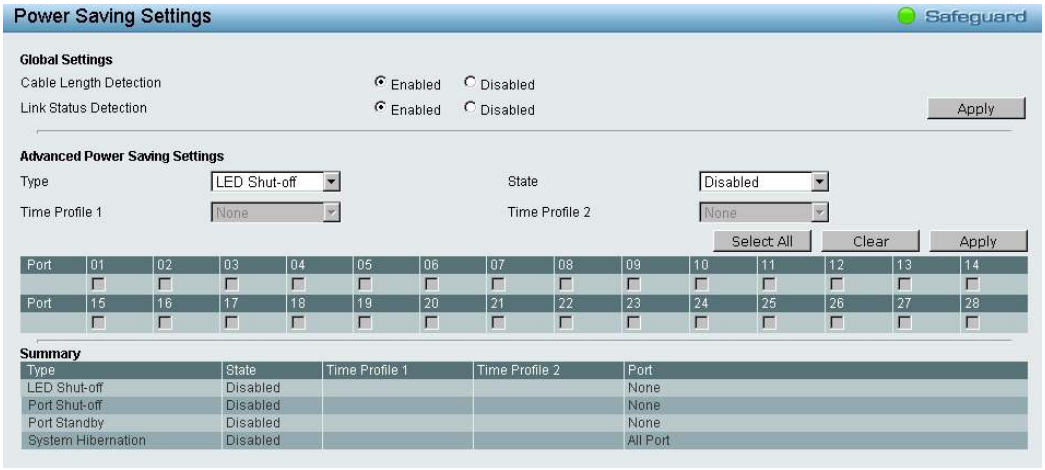


Figure 5.24 – System > Power Saving

Advanced Power Saving Settings:

Type: Specifies the Power Saving type to be LED Shut-off, Port Shut-off, Port Standby or System Hibernation.

> **LED Shut-off -** The LED Shut-off gets high priority. If the user select LED Shut-off, the profile function will not take effect. It means the LED can not be turned on after Time Profile time's up when the state is disabled. On the contrary, if the LED is enabled, the Time Profile function will work.
>
> **Port Shut-off -** The Port Shut-off state has high priority (the priority rule is the same as LED.) Therefore, if the Port Shut-off sate is already disabled the Time Profile function will not take effect.
>
> **Port Standby -** The system changes to standby state and wait for a wake up event. Each port on the system enters sleep state by schedule.
>
> **System Hibernation -** In this mode, switches get most power-saving figures since main chipsets (both MAC and PHY) are disabled for all ports, and energy required to power the CPU is minimal.

State: Specifies the power saving state to be Enabled or Disabled.

Time Profile 1: Specifies the time profile or None.

Time Profile 2: Specifies the time profile or None.

Port: Specifies the ports to be configure of the Power Saving.

Click **Select All** configure all ports, or click **Clear** to uncheck all port. Then click **Apply** to implement changes made.

System > IEEE802.3az EEE settings

The IEEE 802.3 EEE standard defines mechanisms and protocols intended to reduce the energy consumption of network links during periods of low utilization, by transitioning interfaces into a low-power state without interrupting the network connection. The transmitted and received sides should be IEEE802.3az EEE compliance. By default, the switch disabled the 802.3az EEE function. Users can enable this feature by individual port via the IEEE802.3az EEE setting page.

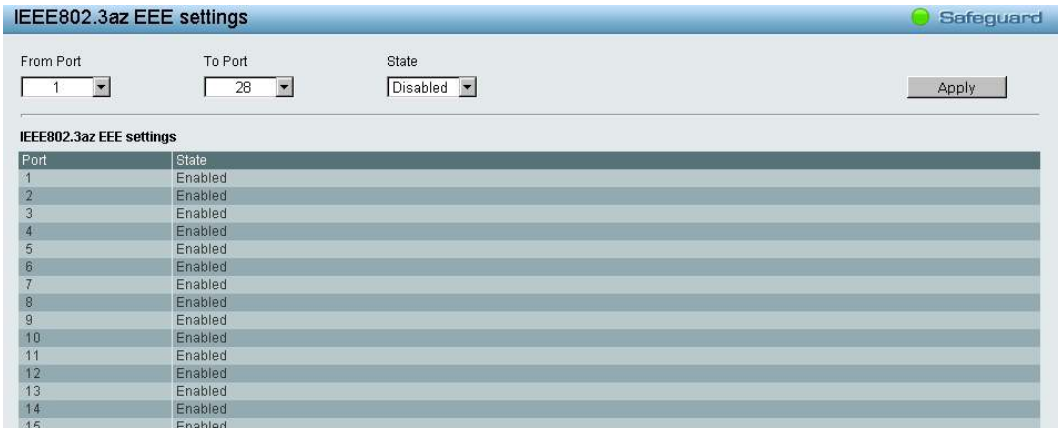


Figure 5.25 – System > IEEE802.3az EEE settings

From Port / To Port: A consecutive group of ports may be configured starting with the selected port.

State: Enabled or Disabled the IEEE802.3az EEE for the specified ports. By default, all ports are disabled.

VLAN > 802.1Q VLAN

A VLAN is a group of ports that can be anywhere in the network, but communicate as though they were in the same area.

VLANs can be easily organized to reflect department groups (such as R&D, Marketing), usage groups (such as e-mail), or multicast groups (multimedia applications such as video conferencing), and therefore help to simplify network management by allowing users to move devices to a new VLAN without having to change any physical connections.

The IEEE 802.1Q VLAN Configuration page provides powerful VID management functions. The original settings have the VID as 1, no default name, and all ports as “Untagged”

Delete: Click to delete the VLAN group.

Add: Click to create a new VID group, assigning ports from 01 to 28 as **Untag**, **Tag**, or **Not Member**. A port can be untagged in only one VID. To save the VID group, click **Apply.**

You may change the name accordingly to the desired groups, such as R&D, Marketing, email, etc.

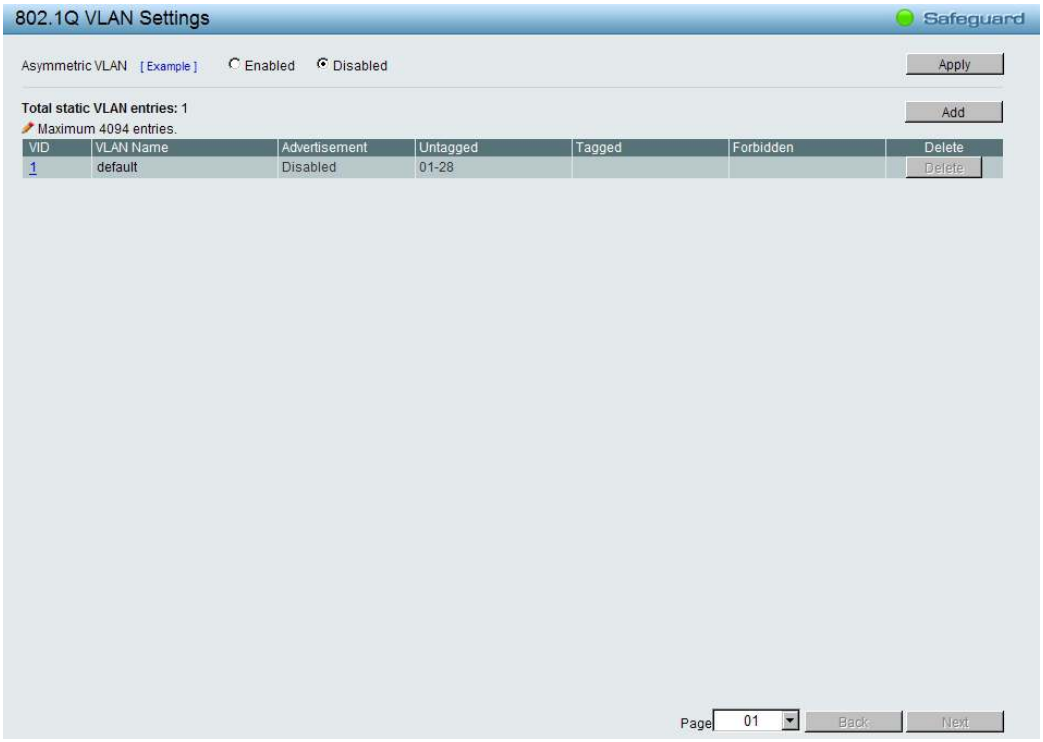


Figure 5.26 – VLAN > 802.1Q VLAN

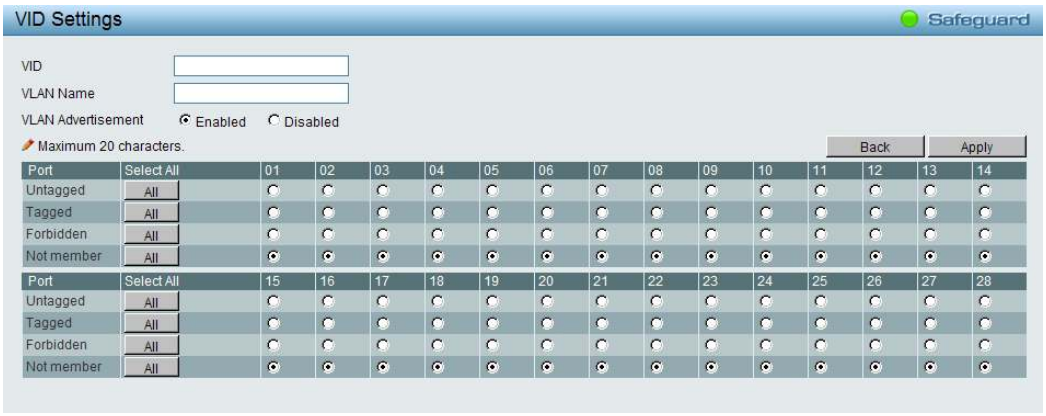


Figure 5.27 – Configuration > 802.1Q VLAN > Add VID

Figure 5.28 – Configuration > 802.1Q VLAN > Example VIDs

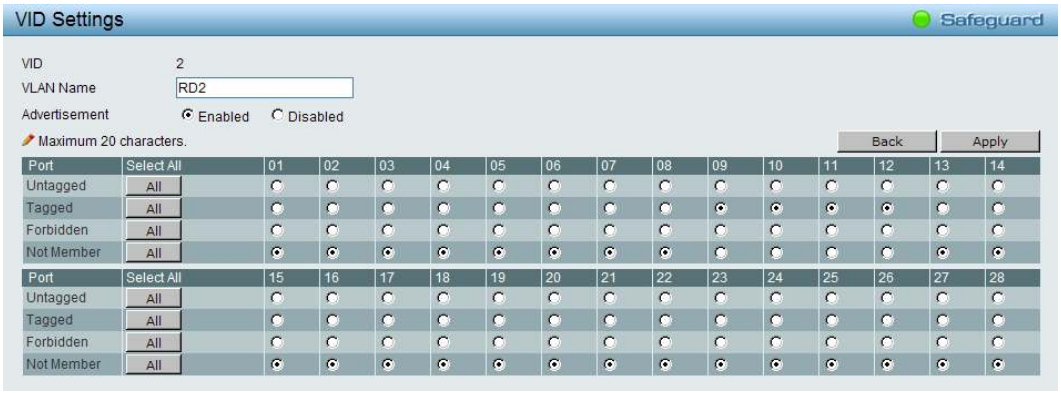


Figure 5.29 – Configuration > 802.1Q VLAN > VID Assignments

VLAN > VLAN Status

The VLAN Status page is for user to search the VLAN which has already existed by **VLAN ID** or **VLAN Name**.

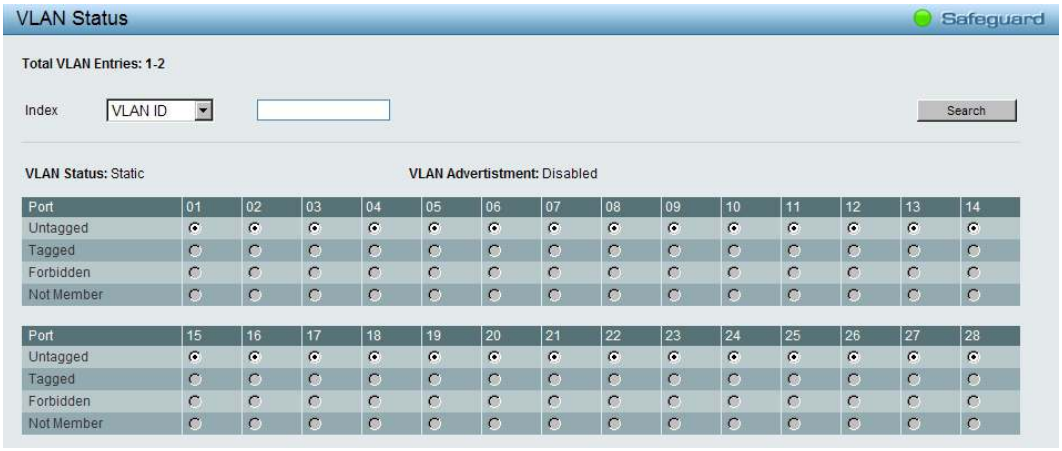


Figure 5.30 – VLAN > VLAN Status

VLAN > GVRP > GVRP Global Settings

The GVRP Global Settings page allows user to configure the GARP timer values for application join, leave, and leave_all GARP timer values.

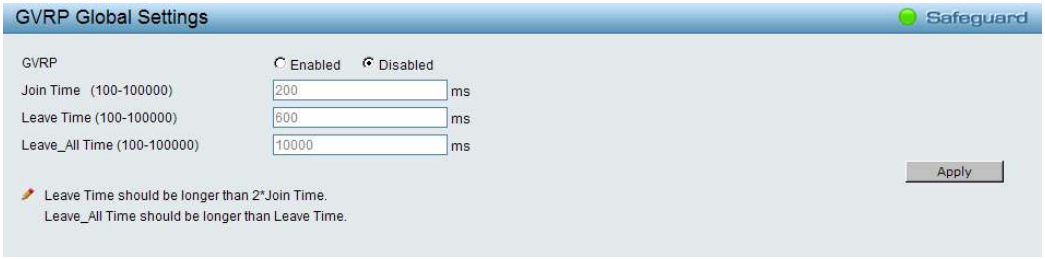


Figure 5.31 – VLAN > GVRP > GVRP Global Settings

GVRP: Disabled or Enabled the GVRP status.

Join Time (100-100000): Indicates the time in milliseconds that PDUs are transmitted. The default value is *200ms*.

Leave Time (100-100000): Indicates the amount of time in milliseconds that the device waits before leaving its GARP state. The leave time is activated by a leave all time message sent/received, and cancelled by the Join message. The default value is *600ms*.

Leave_All Time (100-100000): Used to confirm the port within the VLAN. The time in milliseconds between messages sent. The default value is *10000ms*.

Click **Apply** to implement changes made.

NOTE: Leave time must be greater than or equal to three times the join time.

Leave_all time must be greater than the leave time.

VLAN > GVRP > GVRP Port Settings

The GVRP Port Settings page allows user to determine whether the Switch will share its VLAN configuration information with other **GARP VLAN Registration Protocol (GVRP)** enabled switches. In addition, Ingress Checking can be used to limit traffic by filtering incoming packets whose PVID does not match the PVID of the port. Results can be seen in the table under the configuration settings, as seen below.

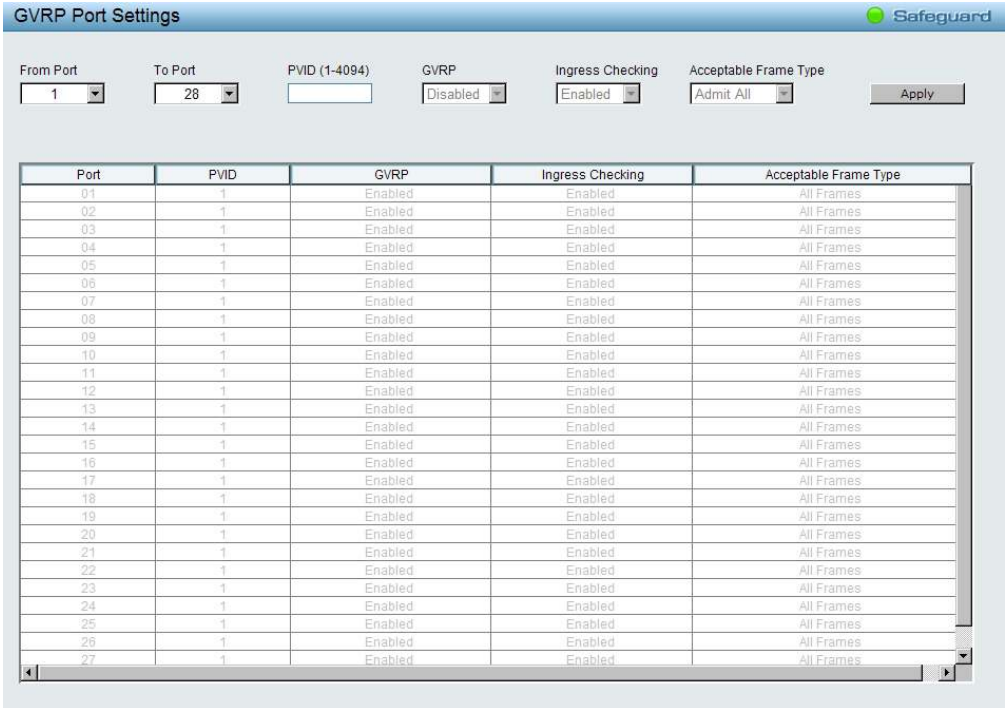

GVRP Port Settings
Safeguard
From Port
1
To Port
28
PVID (1-4094)
GVRP
Disabled
Ingress Checking
Enabled
Acceptable Frame Type
Admit All
Apply
Port
PVID
GVRP
Ingress Checking
Acceptable Frame Type
01 1 Enabled Enabled All Frames
02 1 Enabled Enabled All Frames
03 1 Enabled Enabled All Frames
04 1 Enabled Enabled All Frames
05 1 Enabled Enabled All Frames
06 1 Enabled Enabled All Frames
07 1 Enabled Enabled All Frames
08 1 Enabled Enabled All Frames
09 1 Enabled Enabled All Frames
10 1 Enabled Enabled All Frames
11 1 Enabled Enabled All Frames
12 1 Enabled Enabled All Frames
13 1 Enabled Enabled All Frames
14 1 Enabled Enabled All Frames
15 1 Enabled Enabled All Frames
16 1 Enabled Enabled All Frames
17 1 Enabled Enabled All Frames
18 1 Enabled Enabled All Frames
19 1 Enabled Enabled All Frames
20 1 Enabled Enabled All Frames
21 1 Enabled Enabled All Frames
22 1 Enabled Enabled All Frames
23 1 Enabled Enabled All Frames
24 1 Enabled Enabled All Frames
25 1 Enabled Enabled All Frames
26 1 Enabled Enabled All Frames
27 1 Enabled Enabled All Frames

Figure 5.32 – VLAN > GVRP > GVRP Port Settings

From Port/To Port: These two fields allow user to specify the range of ports that will be included in the Port-based VLAN that user is creating using the 802.1Q Port Settings page.

PVID(1-4094): The read-only field in the 802.1Q Port Table shows the current PVID assignment for each port, which may be manually assigned to a VLAN when created in the Settings table. The Switch's default is to assign all ports to the default VLAN with a VID of 1. The PVID is used by the port to tag outgoing, untagged packets, and to make filtering decisions about incoming packets. If the port is specified to accept only tagged frames - as tagging, and an untagged packet is forwarded to the port for transmission, the port will add an 802.1Q tag using the PVID to write the VID in the tag. When the packet arrives at its destination, the receiving device will use the PVID to make VLAN forwarding decisions. If the port receives a packet, and Ingress filtering is enabled, the port will compare the VID of the incoming packet to its PVID. If the two are unequal, the port will drop the packet. If the two are equal, the port will receive the packet.

GVRP: The Group VLAN Registration Protocol (GVRP) enables the port to dynamically become a member of a VLAN. GVRP is Disabled by default.

Ingress Checking: This field can be toggled using the space bar between Enabled and Disabled. Enabled enables the port to compare the VID tag of an incoming packet with the PVID number assigned to the port. If the two are different, the port filters (drops) the packet. Disabled disables ingress filtering. Ingress Checking is *Disabled* by default.

Acceptable Frame Type: This field denotes the type of frame that will be accepted by the port. The user may choose between **Tagged Only**, which means only VLAN tagged frames will be accepted, and Admit_All, which mean both tagged and untagged frames will be accepted. **Admit_All** is enabled by default.

Click **Apply** to implement changes made.

VLAN > Voice VLAN > Voice VLAN Global Settings

Voice VLAN is a feature that allows you to automatically place the voice traffic from IP phone to an assigned VLAN to enhance the VoIP service. With a higher priority and individual VLAN, the quality and the security of VoIP traffic are guaranteed. The Voice VLAN function will only insert the Voice VLAN tag to untagged packets under corresponding ports. If a VoIP packet comes with a VLAN tag, the Voice VLAN function won't replace the original VLAN tag.

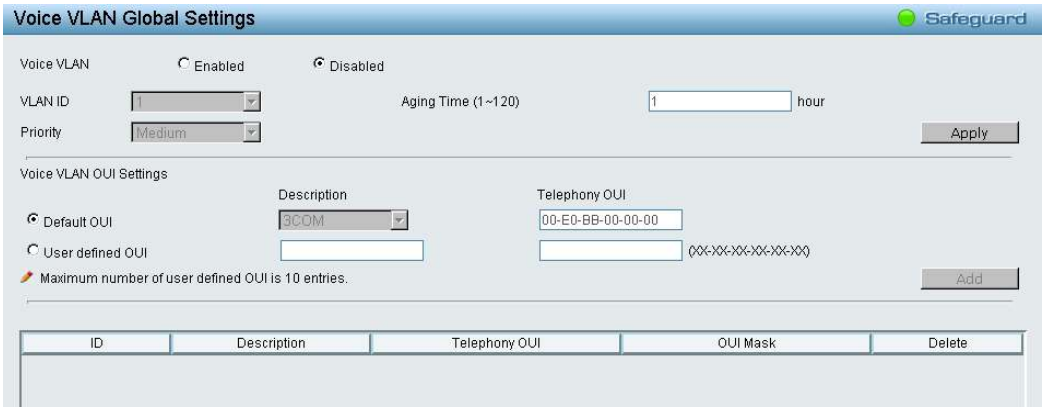


Figure 5.33 – VLAN > Voice VLAN > Voice VLAN Global Settings

Voice VLAN State: Select to Enable or Disable Voice VLAN. The default is *Disabled.*

VLAN ID: The ID of VLAN that you want to assign voice traffic to. You must first create a VLAN from the 802.1Q VLAN page before you can assign a dedicated Voice VLAN. The member port you configured in 802.1Q VLAN setting page will be the static member port of voice VLAN. To dynamically add ports into the voice VLAN, please enable the **Auto Detection** function

Aging Time: Enter a period of time in hours to remove a port from voice VLAN if the port is an automatic VLAN member. When the last voice device stops sending traffic and the MAC address of this voice device is aged out, the voice VLAN aging timer will be started. The port will be removed from the voice VLAN after expiration of voice VLAN aging timer. Selectable range is from 1 to 120 hours and default is 1 hour.

Priority: The 802.1p priority levels of the traffic in the Voice VLAN. The default priority is highest.

Voice VLAN OUI Settings: this allows the user to configure the user-defined voice traffic's OUI. An Organizationally Unique Identifier (OUI) is the first three bytes of the MAC address. This identifier uniquely identifies a vendor, manufacturer, or other organization.

Default OUI: Pre-defined OUI values, including brand names of 3COM, Cisco, Veritel, Pingtel, Siemens, NEC/Philips, Huawei3COM, and Avaya.

User defined OUI: You can manually create a Telephony OUI with a description. The maximum number of user defined OUIs is 10. It will occupy one ACL rule when selecting user defined OUI by default, and to configure one user-defined OUI will take extra one ACL rule. System will auto generate an ACL profile (Profile ID: 51) for all the Voice VLAN rules.

There are some pre-defined OUIs and when the user configures personal OUI, these pre-defined OUIs must be avoided. Below are the pre-defined voice traffic's OUI:

OUI	Vendor	Mnemonic Name
00:E0:BB	3COM	3com
00:03:6B	Cisco	cisco
00:E0:75	Veritel	veritel
00:D0:1E	Pingtel	pingtel
00:01:E3	Siemens	siemens
00:60:B9	NEC/ Philips	nec&philips
00:0F:E2	Huawei-3COM	huawei&3com
00:09:6E	Avaya	avaya

Select the OUI and press **Add** to the lower table to complete the Auto Voice VLAN setting.

Note: The default OUI for 3COM, Cisco, Veritel, Pingtel, Siemens, NEC/Philips, Huawei3COM, and Avaya is not common for all of their VoIP devices.

VLAN > Voice VLAN > Voice VLAN Port Settings

The Voice VLAN Port Settings page allows users to automatically place the voice traffic from IP phone to an assigned VLAN to enhance the VoIP service. With a higher priority and individual VLAN, the quality and the security of VoIP traffic are guaranteed.

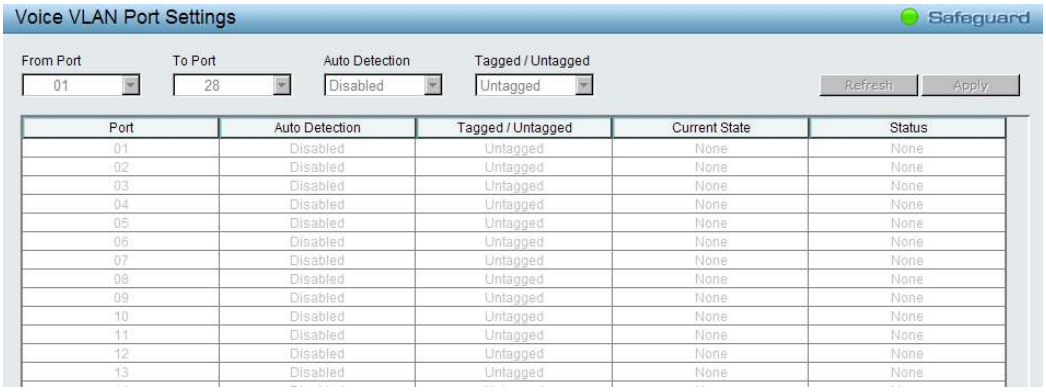


Figure 5.34 – VLAN > Voice VLAN > Voice VLAN Port Settings

From Port / To Port: A consecutive group of ports may be configured starting with the selected port.

Auto Detection: Switch will add ports to the voice VLAN automatically if it detects the device OUI matches the Telephony OUI configured in Voice VLAN OUI Setting page. Use the drop-down menu to enable or disable the OUI auto detection function. The default is *Disabled*

Tagged / Untagged: tagged or untagged the ports.
Click **Apply** to implement changes made and **Refresh** to refresh the voice vlan table.

Note: Voice VLAN has higher priority than any other features even QoS. Therefore the voice traffic will be operated according to Voice VLAN setting and not impacted by QoS feature.

Note: It is recommended setting the highest priority for Voice VLAN to guarantee the quality of VoIP traffic.

VLAN > Voice VLAN > Voice Device List

The Voice Device List page displays the information of Voice VLAN.

Figure 5.35 – VLAN > Voice VLAN > Voice Device List

Select a port or all ports and click **Search** to display the Voice Device information in the table.

VLAN > Auto Surveillance VLAN

Similar as Voice VLAN, Auto Surveillance VLAN is a feature that allows you to automatically place the video traffic from D-Link IP cameras to an assigned VLAN to enhance the IP surveillance service. With a higher priority and individual VLAN, the quality and the security of surveillance traffic are guaranteed. The Auto Surveillance VLAN function will check the source OUI/MAC address / VLAN ID on the incoming packets. If it matches specified MAC address / VLAN ID, the packets will pass through switch with desired priority.

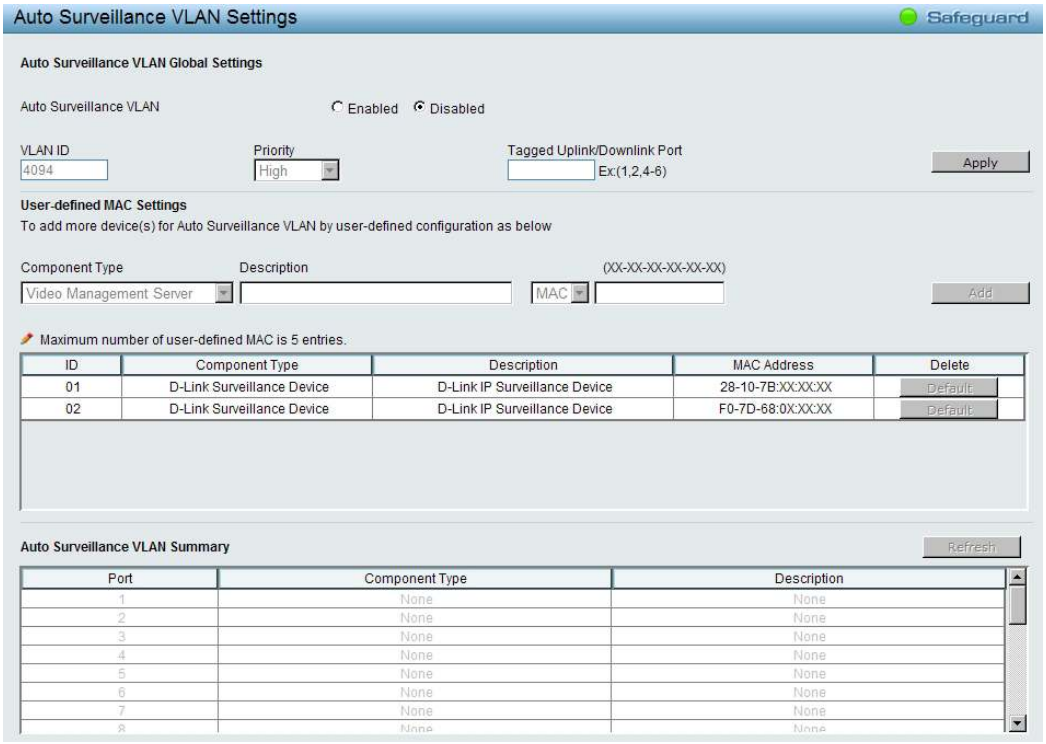


Figure 5.36 – VLAN > Auto Surveillance VLAN

Auto Surveillance VLAN Global Settings:

Auto Surveillance VLAN State: Select to enable or disable Auto Surveillance VLAN. The default is *Disabled.*

VLAN ID: By default, the VLAN ID 4094 was created as Auto Surveillance VLAN. You also can create another Auto Surveillance VLAN by selecting a VLAN ID that you have created a VLAN from the 802.1Q VLAN page. The member port you configured in 802.1Q VLAN setting page will be the static member port of Auto Surveillance VLAN.

Priority: Specifies the priority level of Auto Surveillance VLAN on the Switch. The possible values are *Highest, High, Medium and Low.* The default priority is High.

Tagged Uplink/Downlink Port: Specifies the port or ports to be tagged uplink port or downlink port for the Auto Surveillance VLAN.

Click **Apply** to implement changes of Auto Surveillance VLAN global settings.

User-defined MAC Settings:

Component Type: Auto Surveillance VLAN will automatically detect D-Link Surveillance Devices by default. There are another five surveillance components that could be configured to be auto-detected by the Auto Surveillance VLAN. These five components are *Video Management Server (VMS), VMS Client/Remote viewer, Video Encoder, Network Storage* and Other *IP Surveillance Devices*.

Description: Specifies the description for the component type.

MAC/OUI: You can manually create an MAC or OUI address for the surveillance component. The maximum number of user defined MAC address is 5. System will auto generate an ACL profile (Profile ID: 56) for all the Auto Surveillance VLAN rules.

Click **Add** to create a new surveillance component and **Refresh** to refresh the Auto Surveillance VLAN summary table.

L2 Functions > Jumbo Frame

Jumbo Frame support is designed to enhance Ethernet networking throughput and significantly reduce the CPU utilization of large file transfers like large multimedia files or large data files by enabling more efficient larger payloads per packet. The Jumbo Frame page allows network managers to enable Jumbo Frames on the device.

The Jumbo Frame default is disabled, Select **Enabled** then click **Apply** to turn on the jumbo frame support.

Figure 5.37 – L2 Functions > Jumbo Frame Settings

L2 Functions > Port Mirroring

Port Mirroring is a method of monitoring network traffic that forwards a copy of each incoming and/or outgoing packet from one port of the Switch to another port where the packet can be studied. This enables network managers to better monitor network performances.

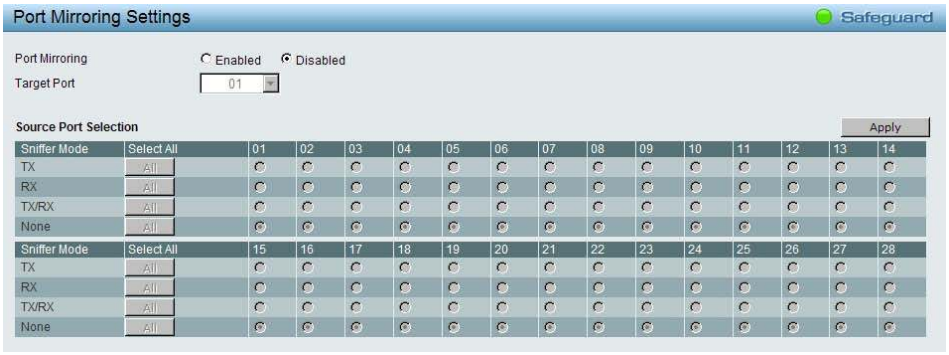


Figure 5.38 – L2 Functions > Port Mirroring Settings

Port Mirroring: Enables or disables the Port Mirroring status.

Target Port: Defines the target port.

Source Port Selection:

TX: Duplicates the data transmitted from the source port and forwards it to the Target Port. Click "all" to include all ports into port mirroring.

RX: Duplicates the data that received from the source port and forwards it to the Target Port. Click "all" to include all ports into port mirroring.

TX/RX: Duplicate both the data transmitted from and data sent to the source port, and forwards all the data to the assigned Target Port. Click "all" to include all ports into port mirroring.

None: Turns off the mirroring of the port. Click "all" to remove all ports from mirroring.

Click **Apply** to capture the configured Source Ports.

L2 Functions > Loopback Detection

The Loopback Detection function is used to detect the loop created by a specific port while Spanning Tree Protocol (STP) is not enabled in the network, especially when the down links are hubs or unmanaged switches. The Switch will automatically shutdown the port and sends a log to the administrator. The Loopback Detection port will be unlocked when the Loopback Detection **Recover Time** times out. The Loopback Detection function can be implemented on a range of ports at a time. You may enable or disable this function using the pull-down menu.

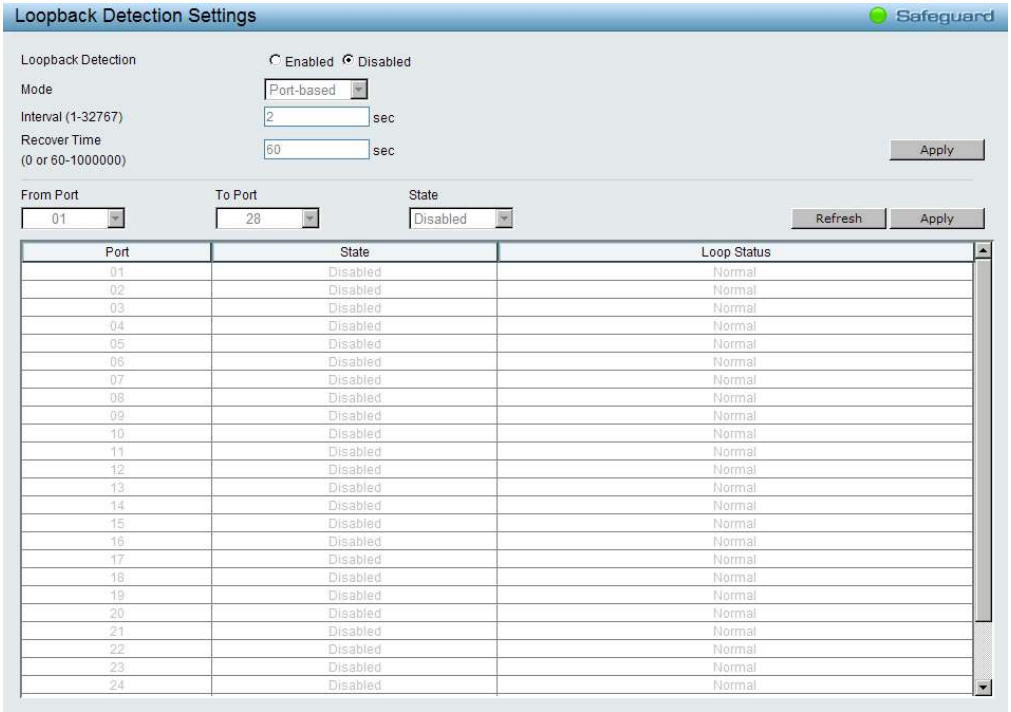


Figure 5.39 – L2 Functions > Loopback Detection Settings

Loopback Detection State: Enable or disable loopback detection. The default is *Disabled.*

Mode: Specifies Port-based or VLAN-based mode.

Interval (1-32767): Set a Loop detection Interval between *1* and *32767* seconds. The default is 2 seconds.

Recover Time (0 or 60-1000000): Time allowed (in seconds) for recovery when a Loopback is detected. The Loop Detection Recover Time can be set at *0* seconds, or *60* to *1000000* seconds. Entering *0* will disable the Loop Detection Recover Time. The default is *60* seconds.

From Port: The beginning of a consecutive group of ports may be configured starting with the selected port.

To Port: The ending of a consecutive group of ports may be configured starting with the selected port.

State: Use the drop-down menu to toggle between *Enabled* and *Disabled.* Default is *Disabled*.

Click **Apply** to implement changes made or click Refresh to **refresh** the Loopback Detection table.

L2 Functions > MAC Address Table > Static MAC

This feature provides two distinct functions. The **Disable Auto Learning** table allows turning off the function of learning MAC address automatically, if a port isn't specified as an uplink port (for example, connects to a DHCP Server or Gateway). By default, this feature is Disabled.

Figure 5.40 – L2 Functions > MAC Address Table > Static MAC

To initiate the removal of auto-learning for any of the uplink ports, enable this feature, and then select the port(s) for auto learning to be disabled.

The **Static MAC Address Lists** table displays the static MAC addresses connected, as well as the VID. Click **Add** to add a new MAC address, you also need to select the assigned Port number. Enter both the Mac Address and VID, and then Click **Add**. Click **Delete** to remove one entry or click **Delete all** to clear the list.

By disabling Auto Learning capability and specifying the static MAC addresses, the network is protected from potential threats like hackers, because traffic from illegal MAC addresses will not be forwarded by the Switch.

L2 Functions > MAC Address Table > Dynamic Forwarding Table

For each port, this table displays the MAC address learned by the Switch. To add a MAC address to the Static Mac Address List, click the **Add to Static MAC** checkbox, and then click **Apply** associated with the identified address.

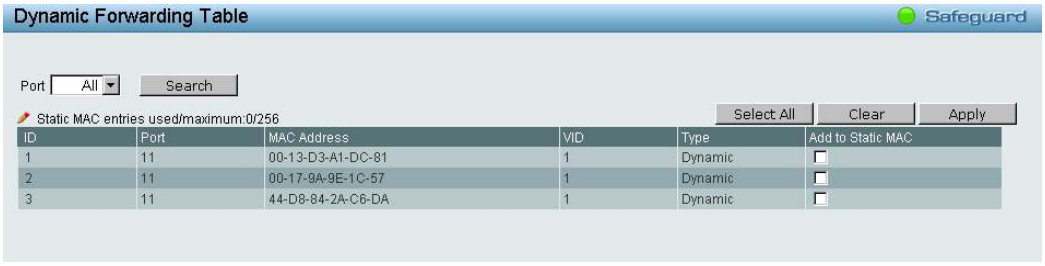


Figure 5.41 – L2 Functions > MAC Address Table > Dynamic Forwarding Table

L2 Functions > Spanning Tree > STP Bridge Global Settings

The Switch implements three versions of the Spanning Tree Protocol, the Rapid Spanning Tree Protocol (RSTP) as defined by the IEEE 802.1w specification, a version compatible with the IEEE 802.1D STP and the Multiple Spanning Tree Protocol (MSTP) as defined by the IEEE802.1 specification. RSTP can operate with legacy equipment implementing IEEE 802.1D, however the advantages of using RSTP will be lost.

The IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) evolved from the 802.1D STP standard. RSTP was developed in order to overcome some limitations of STP that impede the function of some recent switching innovations. The basic function and much of the terminology is the same as STP. Most of the settings configured for STP are also used for RSTP. This section introduces some new Spanning Tree concepts and illustrates the main differences between the two protocols.

The IEEE 802.1 Multiple Spanning Tree (MSTP) provides various load balancing scenarios by allowing multiple VLANs to be mapped to a single spanning tree instance, providing multiple pathways across the network. For example, while port A is blocked in one STP instance, the same port can be placed in the Forwarding state in another STP instance.

By default, Rapid Spanning Tree is disabled. If enabled, the Switch will listen for BPDU packets and its accompanying Hello packet. BPDU packets are sent even if a BPDU packet was not received. Therefore, each link between bridges is sensitive to the status of the link. Ultimately this difference results in faster detection of failed links, and thus faster topology adjustment.

By default Multiple Spanning Tree is enabled. It will tag BPDU packets to receiving devices and distinguish spanning tree instances, spanning tree regions and the VLANs associated with them.

After enabling STP, setting the STP Bridge Global Setting includes the following options.

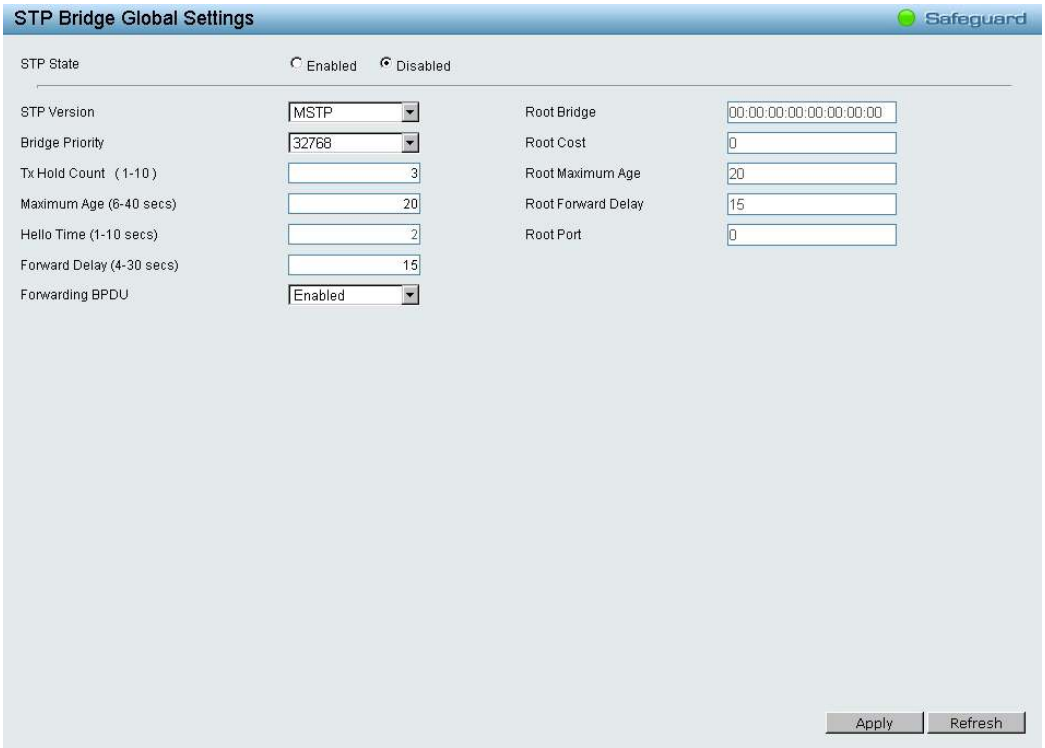


Figure 5.42 – L2 Functions > Spanning Tree > STP Bridge Global Settings

Spanning Tree Protocol: Specify the Spanning Tree Protocol to be Enabled or Disabled.

STP Version: You can choose MSTP, RSTP or STP Compatible. The default setting is MSTP.

Bridge Priority: This value between 0 and 61410 specifies the priority for forwarding packets: the lower the value, the higher the priority. The default is 32768.

TX Hold Count (1-10): Used to set the maximum number of Hello packets transmitted per interval. The count can be specified from *1* to *10*. The default is 3.

Maximum Age (6-40 sec): This value may be set to ensure that old information does not endlessly circulate through redundant paths in the network, preventing the effective propagation of the new information. Set by the Root Bridge, this value will aid in determining that the Switch has spanning tree configuration values consistent with other devices on the bridged LAN. If the value ages out and a BPDU has still not been received from the Root Bridge, the Switch will start sending its own BPDU to all other switches for permission to become the Root Bridge. If it turns out that the Switch has the lowest Bridge Identifier, it will become the Root Bridge. A time interval may be chosen between 6 and 40 seconds. The default value is 20. (Max Age has to have a value bigger than Hello Time)

Hello Time (1-10 sec): The user may set the time interval between transmissions of configuration messages by the root device, thus stating that the Switch is still functioning. The default is 2 seconds.

Forward Delay (4-30 sec): This sets the maximum amount of time that the root device will wait before changing states. The default is 15 seconds.

Forwarding BPDU: Bridges use Bridge Protocol Data Units (BPDU) to provide spanning tree information. STP BPDUs filtering is useful when a bridge interconnects two regions; each region needing a separate spanning tree. BPDU filtering functions only when STP is disabled either globally or on a single interface. The possible field values are:

Disabled – BPDU filtering is enabled on the port.

Enabled – BPDU forwarding is enabled on the port (if STP is disabled).

Root Bridge: Displays the MAC address of the Root Bridge.

Root Cost: Displays the cost of the Root Bridge. The default is 0.

Root Maximum Age: Displays the Maximum Age of the Root Bridge. The default is 20.

Root Forward Delay: Displays the Forward Delay of the Root Bridge. The default is 15.

Root port: Displays the root port. The default is 0.

Click **Apply** for the settings to take effect. Click **Refresh** to renew the page.

L2 Functions > Spanning Tree > STP Port Settings

STP can be set up on a port per port basis. In addition to setting Spanning Tree parameters for use on the switch level, the Switch allows for the configuration of groups of ports, each port-group of which will have its own spanning tree, and will require some of its own configuration settings.

An STP Group spanning tree works in the same way as the switch-level spanning tree, but the root bridge concept is replaced with a root port concept. A root port is a port of the group that is elected based on port priority and port cost, to be the connection to the network for the group. Redundant links will be blocked, just as redundant links are blocked on the switch level.

The STP on the switch level blocks redundant links between switches (and similar network devices). The port level STP will block redundant links within an STP Group.

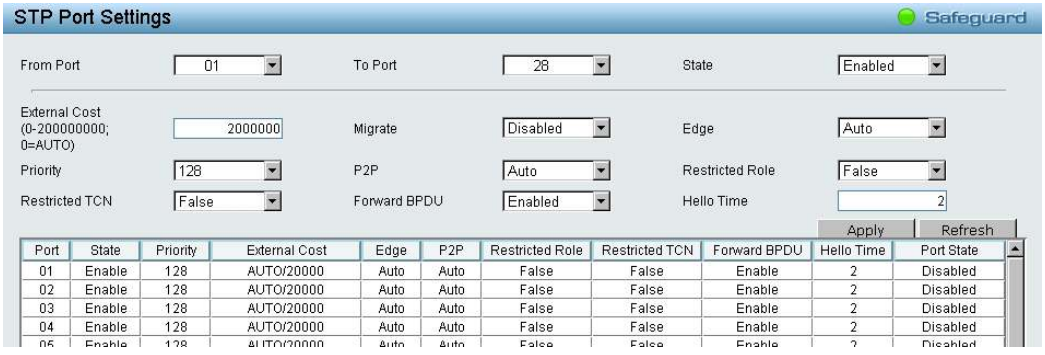


Figure 5.43 – L2 Functions > Spanning Tree > STP Port Settings

From Port/To Port: A consecutive group of ports may be configured starting with the selected port.

State: Use the drop-down menu to enable or disable STP by per-port based. It will be selectable after the global STP is enabled.

External Cost: This defines a metric that indicates the relative cost of forwarding packets to the specified port list. Port cost can be set automatically or as a metric value. The default value is *0* (auto).

0 (auto) - Setting 0 for the external cost will automatically set the speed for forwarding packets to the specified port(s) in the list for optimal efficiency. Default port cost: 100Mbps port = 200000. Gigabit port = 20000.

Value 1-200000000 - Define a value between 1 and 200000000 to determine the external cost. The lower the number, the greater the probability the port will be chosen to forward packets.

Migrate: Setting this parameter as *Yes* will set the ports to send out BPDU packets to other bridges, requesting information on their STP setting. If the Switch is configured for RSTP, the port will be capable to migrate from 802.1d STP to 802.1w RSTP. Migration should be set as yes on ports connected to network stations or segments that are capable of being upgraded to 802.1w RSTP on all or some portion of the segment.

Edge: Selecting the *True* parameter designates the port as an edge port. Edge ports cannot create loops, however an edge port can lose edge port status if a topology change creates a potential for a loop. An edge port normally should not receive BPDU packets. If a BPDU packet is received, it automatically loses edge port status. Selecting the *False* parameter indicates that the port does not have edge port status. Selecting the *Auto* parameter indicates that the port have edge port status or not have edge port status automatically.

Priority: Specify the priority of each port. Selectable range is from 0 to 240, and the default setting is 128. The lower the number, the greater the probability the port will be chosen as a root port.

P2P: Choosing the *True* parameter indicates a point-to-point (P2P) shared link. P2P ports are similar to edge ports however they are restricted in that a P2P port must operate in full-duplex.

Like edge ports, P2P ports transition to a forwarding state rapidly thus benefiting from RSTP. A p2p value of *false* indicates that the port cannot have p2p status. *Auto* allows the port to have p2p status whenever possible and operate as if the p2p status were true. If the port cannot maintain this status, (for example if the port is forced to half-duplex operation) the p2p status changes to operate as if the p2p value were *False*. The default setting for this parameter is *Auto*.

Restricted Role: Toggle between *True* and *False* to set the restricted role state of the packet. If set to *True*, the port will never be selected to be the Root port. The default value is *False*.

Restricted TCN: Toggle between *True* and *False* to set the restricted TCN of the packet. Topology Change Notification (TCN) is a BPDU that a bridge sends out to its root port to signal a topology change. If set to *True*, it stops the port from propagating received TCN and to other ports. The default value is *False*.

Forwarding BPDU: Bridges use Bridge Protocol Data Units (BPDU) to provide spanning tree information. STP BPDUs filtering is useful when a bridge interconnects two regions; each region needing a separate spanning tree. BPDU filtering functions only when STP is disabled either globally or on a single interface. The possible field values are:

Disabled – BPDU filtering is enabled on the port.

Enabled – BPDU forwarding is enabled on the port (if STP is disabled).

Hello Time: The interval between two transmissions of BPDU packets sent by the Root Bridge to indicate to all other switches that it is indeed the Root Bridge. The default value is 2.

Click **Apply** for the settings to take effect. Click **Refresh** to renew the page.

L2 Functions > Spanning Tree > MST Configuration Identification

Multiple Spanning Tree (MSTP) provides various load balancing scenarios by allowing multiple VLANs to be mapped to a single spanning tree instance, providing multiple pathways across the network. For example, while port A is blocked in one STP instance, the same port can be placed in the Forwarding state in another STP instance.

The MST Configuration Identification page is for defining global MSTP settings, including region names, MSTP revision level.

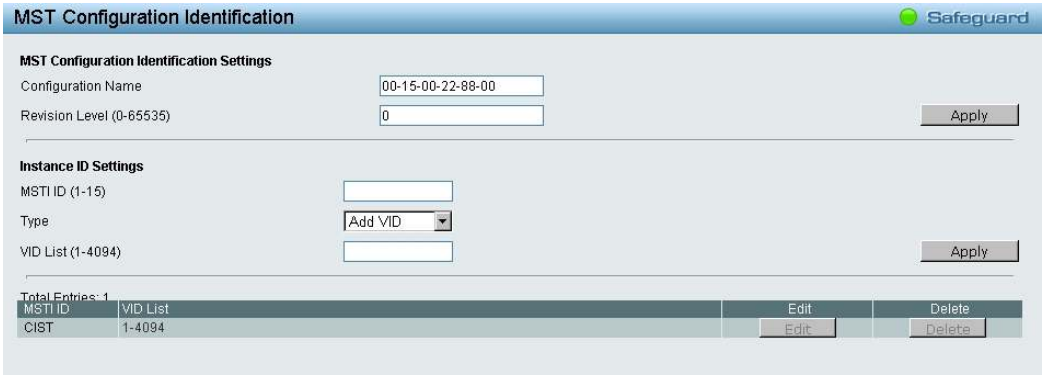


Figure 5.44 – L2 Functions > Spanning Tree > MST Configuration Identification

MST Configuration Identification Settings:

Configuration Name: A configured name set on the switch to uniquely identify the MSTI (multiple spanning tree instance). If a configuration name is not set, this field shows the MAC address of the device running MSTP.

Revision Level(0 - 65535): This value, together with the configuration name, and identical vlans mapped for STP instance IDs identifies the MST region configured on the switch.

Click **Apply** to define the configuration name and revision level.

Instance ID Settings:

MSTI ID (1 - 15): Displays the MSTI ID associated with the VID List. The possible field range is 1-15.

Type: Defines the type of edit. The possible values are:

Add VID - Indicates that edit type is add

Remove VID - Indicates that edit type is removed.

VID List (1 - 4094): Displays the VID List.

Click **Apply** to implement the changes made. Click **Edit** to modify the setting of VID or click **Delete** to remove it.

L2 Functions > Spanning Tree > STP Instance Settings

The STP Instance Settings page display MSTIs currently set on the Switch and allows users to change the Priority of the MSTPs.

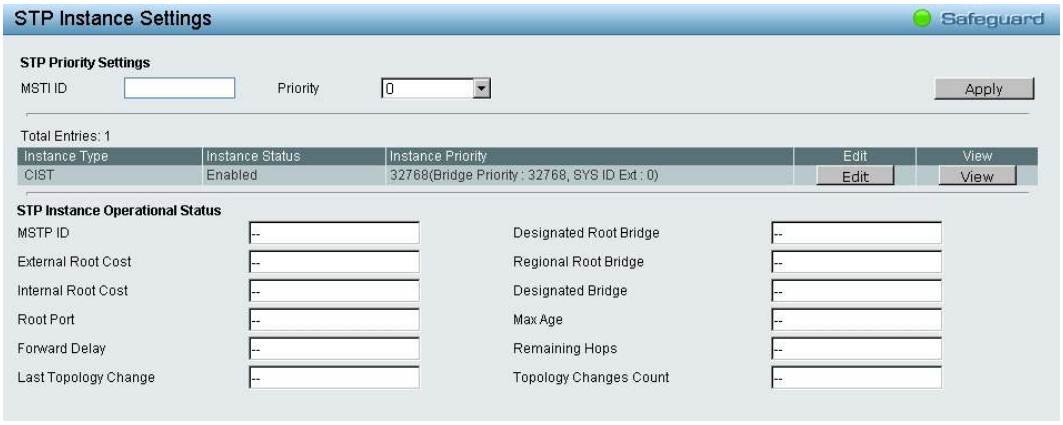


Figure 5.45 – L2 Functions > Spanning Tree > STP Instance Settings

To modify an entry on the table, click the **Edit** button. To view more information about and entry on the table at the top of the window, click the **view** button.

The window above contains the following information:

MSTI ID: Enter the MSTI ID in this field. An entry of *0* denotes the CIST (default MSTI).

Priority: Enter the new priority in the Priority field. The user may set a priority value between *0-61440*.

Click **Apply** to implement the new priority setting.

L2 Functions > Spanning Tree > MSTP Port Information

The MSTP Port Information page provides user to configure the MSTP Interface settings.

Figure 5.46 – L2 Functions > Spanning Tree > MSTP Port Information

Port: Defines the port to find.

Click **Find** to search the MSTP port information.

MSTP Port Setting:

Instance ID: Lists the MSTP instances configured on the device. Possible field range is 0-7.

Internal Path Cost (0-200000000, 0=Auto): Indicates the port contribution to the Spanning Tree instance. The range should always be 1-200,000,000. The default value is automatically set cost, according to its speed. Default port cost: 10Mbps port = 2000000, 100Mbps port = 200000. Gigabit port = 20000, Port-channel = 20000. A lower cost represents a quicker transimission. Selecting 0(zero) for this parameter will set the quickest route automatically and optimally for an interface.

Priority: Defines the interface priority for the specified instance. The default value is 128. A higher priority will designate the interface to forward packets first. A low number denotes a higher priority.

Click **Apply** to implement the changes made or **Edit** to change the port settings.

L2 Functions > Link Aggregation > Port Trunking

The Trunking function enables the combining of two or more ports together to increase bandwidth. Up to eight Trunk groups may be created, and each group consists up to eight ports.

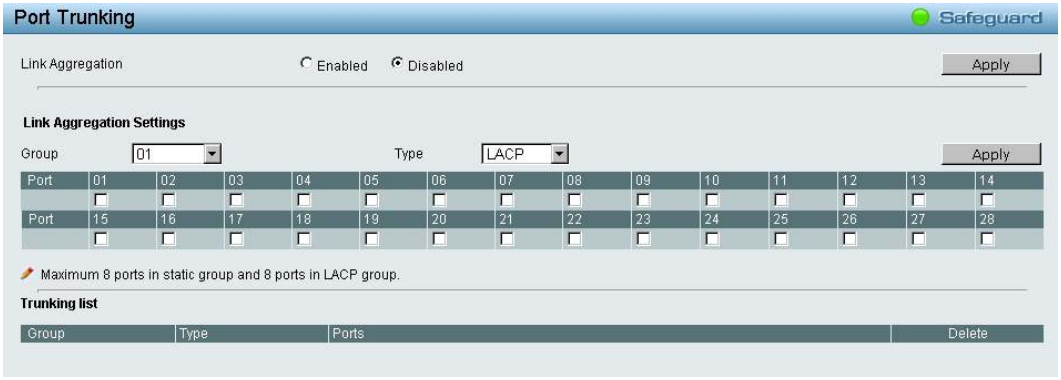


Figure 5.47 – L2 Functions > Link Aggregation > Port Trunking

Link Aggregation State: Enable or Disable the Link Aggregation state.

ID: Specifies the Trunking ID.

Type: Specifies the Link Aggregation type. There are two types can be selected:

Static - Static link aggregation.

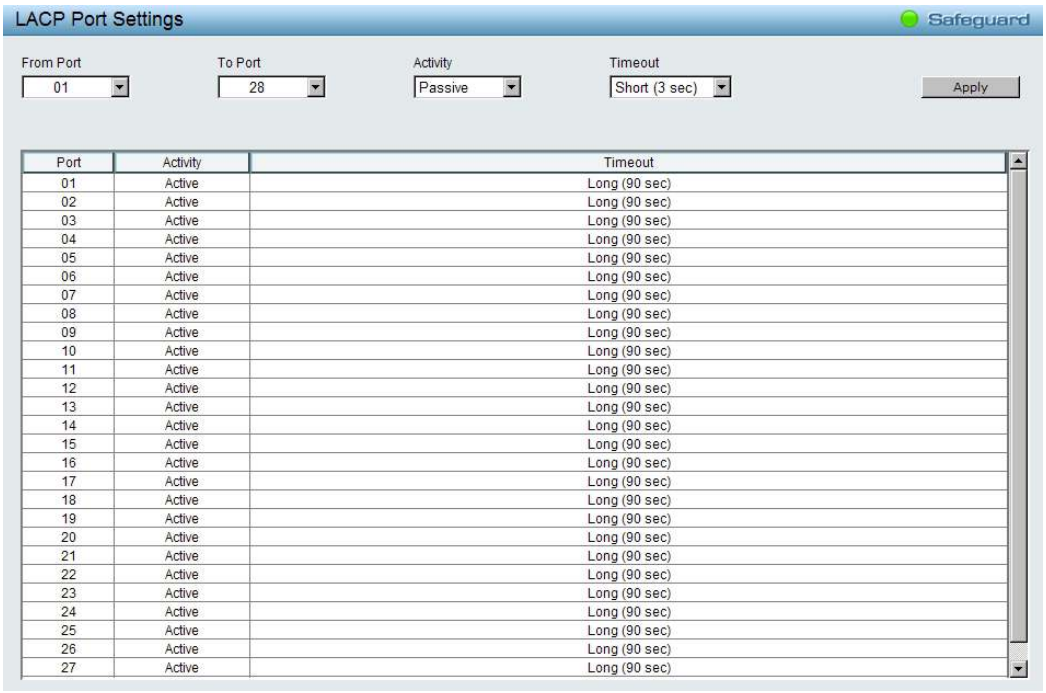
LACP - LACP (Link Aggregation Control Protocol) is enabled on the device. LACP allows for the automatic detection of links in a Port Trunking Group.

Select the ports to be grouped together, and then click **Apply** to activate the selected Trunking groups.

NOTE: Each combined trunk port must be connected to devices within the same VLAN group.

L2 Functions > Link Aggregation > LACP Port Settings

The LACP Port Settings is used to create port trunking groups on the Switch. The user may set which ports will be active and passive in processing and sending LACP control frames



Port	Activity	Timeout
01	Active	Long (90 sec)
02	Active	Long (90 sec)
03	Active	Long (90 sec)
04	Active	Long (90 sec)
05	Active	Long (90 sec)
06	Active	Long (90 sec)
07	Active	Long (90 sec)
08	Active	Long (90 sec)
09	Active	Long (90 sec)
10	Active	Long (90 sec)
11	Active	Long (90 sec)
12	Active	Long (90 sec)
13	Active	Long (90 sec)
14	Active	Long (90 sec)
15	Active	Long (90 sec)
16	Active	Long (90 sec)
17	Active	Long (90 sec)
18	Active	Long (90 sec)
19	Active	Long (90 sec)
20	Active	Long (90 sec)
21	Active	Long (90 sec)
22	Active	Long (90 sec)
23	Active	Long (90 sec)
24	Active	Long (90 sec)
25	Active	Long (90 sec)
26	Active	Long (90 sec)
27	Active	Long (90 sec)

Figure 5.48 – L2 Functions > Link Aggregation > LACP Port Settings

From Port: The beginning of a consecutive group of ports may be configured starting with the selected port.

To Port: The ending of a consecutive group of ports may be configured starting with the selected port.

Activity: There are two different roles of LACP ports:

Active - Active LACP ports are capable of processing and sending LACP control frames. This allows LACP compliant devices to negotiate the aggregated link so the group may be changed dynamically as needs require. In order to utilize the ability to change an aggregated port group, that is, to add or subtract ports from the group, at least one of the participating devices must designate LACP ports as active. Both devices must support LACP.

Passive - LACP ports that are designated as passive cannot initially send LACP control frames. In order to allow the linked port group to negotiate adjustments and make changes dynamically, one end of the connection must have "active" LACP ports.

Timeout: Specify the administrative LACP timeout. The possible field values are:

Short (3 Sec) - Defines the LACP timeout as 3 seconds.

Long (90 Sec) - Defines the LACP timeout as 90 seconds. This is the default value.

Click **Apply** to implement the changes made.

L2 Functions > Multicast > IGMP Snooping

With Internet Group Management Protocol (IGMP) snooping, the Web Smart Switch can make intelligent multicast forwarding decisions by examining the contents of each frame's Layer 2 MAC header.

IGMP snooping can help reduce cluttered traffic on the LAN. With IGMP snooping enabled globally, the Web Smart Switch will forward multicast traffic only to connections that have group members attached.

The settings of IGMP snooping is set by each VLAN individually.

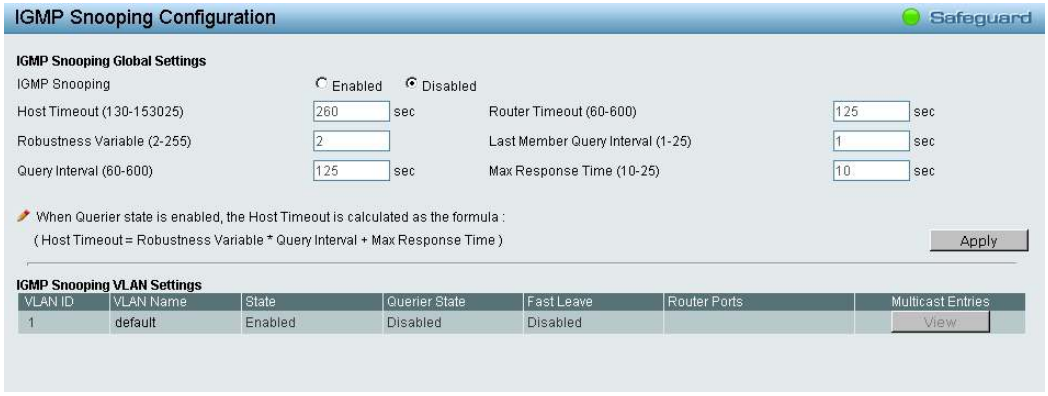


Figure 5.49 – L2 Functions > Multicast > IGMP Snooping

By default, IGMP is disabled. If enabled, the IGMP Global Settings will need to be entered:

Host Timeout (130-153025 sec): This is the interval after which a learned host port entry will be purged. For each host port learned, a 'Port Purge Timer' runs for 'Host Port Purge Interval'. This timer will be restarted whenever a report message from host is received over that port. If no report messages are received for 'Host Port Purge Interval' time, the learned host entry will be purged from the multicast group. The default value is 260 seconds.

Robustness Variable (2-255 sec): The Robustness Variable allows adjustment for the expected packet loss on a subnet. If a subnet is expected to be lossy, the Robustness Variable may need to be increased. The Robustness Variable cannot be set to zero, and it SHOULD NOT be. Default is 2 seconds.

Query Interval (60-600 sec): The Query Interval is the interval between General Queries sent. By adjusting the Query Interval, the number of IGMP messages can be increased or decreased; larger values will cause IGMP Queries to be sent less often. Default value is 125 seconds.

Router Timeout (60-600 sec): This is the interval after which a learned router port entry will be purged. For each router port learned, a 'Router Port Purge Timer' runs for 'Router Port Purge Interval'. This timer will be restarted whenever a Query control message is received over that port. If there are no Query control messages received for 'Router Port Purge Interval' time, the learned router port entry will be purged. Default is 260 seconds.

Last Member Query Interval (1-25 sec): The Last Member Query Interval is the Max Response Time inserted into Group-Specific Queries sent in response to Leave Group messages, and is also the amount of time between Group-Specific Query messages. This value may be adjusted to modify the "leave latency" of the network. A reduced value results in reduced time to detect the loss of the last member of a group. Default is 1 second.

Max Response Time (10-25 sec): The Max Response Time specifies the maximum allowed time before sending a responding report message. Adjusting this setting effects the "leave latency", or the time between the moment the last host leaves a group and when the multicast server is notified that there are no more members. It also allows adjustments for controlling the frequency of IGMP traffic on a subnet. Default is 10 seconds.

To enable IGMP snooping for a given VLAN, select enable and click on the **Apply** button. Then press the **VLAN ID** number under **IGMP Snooping VLAN Setting**, and select the State, Querier State and Fast Leave to be enabled or disabled, and the ports to be assigned as router ports for IGMP snooping for the VLAN. Press **Apply** for changes to take effect. A router port configured manually is a **Static Router Port**, and a **Dynamic Router Port** is dynamically configured by the Switch when a query control message is received.

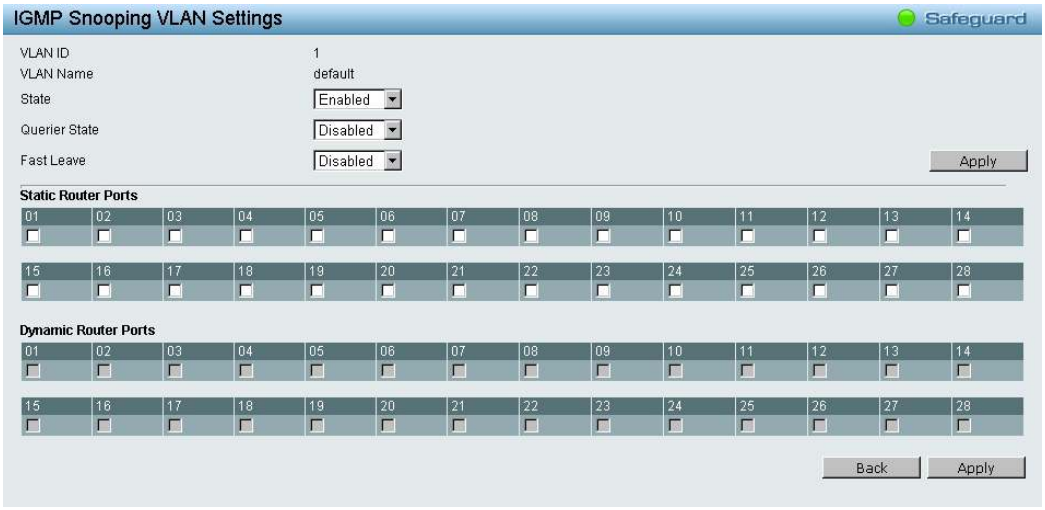


Figure 5.50 –L2 Functions > Multicast > IGMP Snooping VLAN Settings

To view the Multicast Entry Table for a given VLAN, press the **View** button.

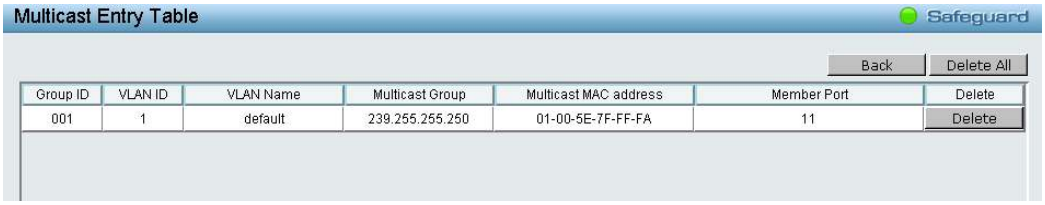


Figure 5.51 –L2 Functions > Multicast > Multicast Entry Table

L2 Functions > Multicast > Multicast Forwarding

The Multicast Forwarding page displays all of the entries made into the Switch's static multicast forwarding table. To implement the Multicast Forwarding Settings, input **VID**, **Multicast MAC Address** and port settings, then click **Add**.

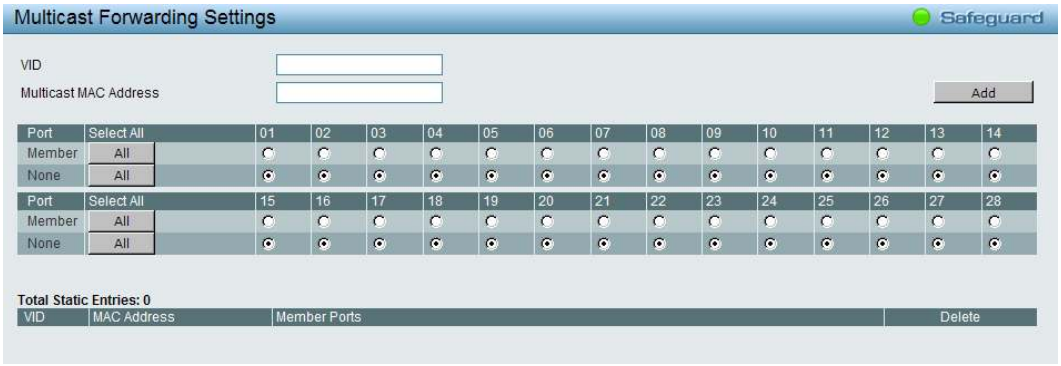


Figure 5.52 – L2 Functaions > Multicast > Multicast Forwarding

VID: The VLAN ID of the VLAN to which the corresponding MAC address belongs.

Multicast MAC Address: The MAC address of the static source of multicast packets. This must be a multicast MAC address.

Port Settings: Allows the selection of ports that will be members of the static multicast group and ports either that are forbidden from joining dynamically, or that can join the multicast group dynamically, using GMRP.

Member - The port is a static member of the multicast group.

None - No restrictions on the port dynamically joining the multicast group. When **None** is chosen, the port will not be a member of the Static Multicast Group.

L2 Functions > Multicast > Multicast Filtering Mode

The Multicast Filtering Mode function allows users to select the filtering mode for IGMP group per VLAN basis.

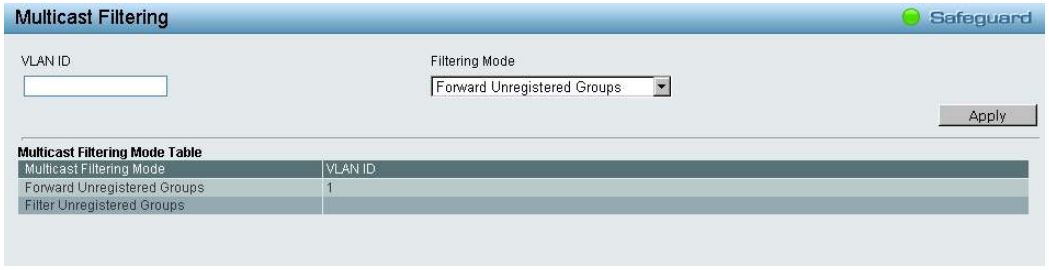


Figure 5.53 – L2 Functions > Multicast > Multicast Filtering Mode

VLAN ID: Specifies the VLAN ID.

Filtering Mode:

Forward Unregistered Groups: The multicast stream will be forwarded based on the register table in registered group, but it will be flooded to all ports of the VLAN in unregistered group.

Filter Unregistered Groups: The registered group will be forwarded based on the register table and the un-register group will be filtered.

Click **Apply** to make the change effective.

L2 Functions > SNTP > Time Settings

SNTP or Simple Network Time Protocol is used by the Switch to synchronize the clock of the computer. The SNTP settings folders contain two windows: Time Settings and TimeZone Settings. Users can configure the time settings for the switch, and the following parameters can be set or are displayed in the Time Settings page.

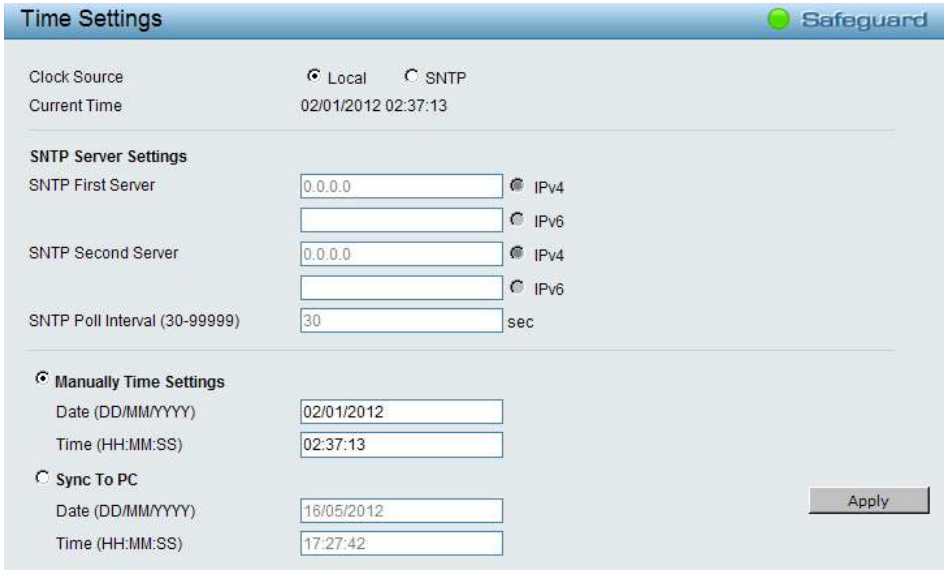


Figure 5.54 – L2 Functions > SNTP > Time Settings

Clock Source: Specify the clock source by which the system time is set. The possible options are:

Local - Indicates that the system time is set locally by the device.

SNTP - Indicates that the system time is retrieved from a SNTP server.

Current Time: Displays the current date and time for the switch.

If choosing **SNTP** for the clock source, then the following parameters will be available:

SNTP First Server: Select IPv4 or IPv6 and specify the IP address of the primary SNTP server from which the system time is retrieved.

SNTP Second Server: Select IPv4 or IPv6 and specify the IP address of the secondary SNTP server from which the system time is retrieved.

SNTP Poll Interval in Seconds (30-99999): Defines the interval (in seconds) at which the SNTP server is polled for Unicast information. The Poll Interval default is 30 seconds.

Click **Apply** to implement changes made.

When selecting **Local** for the clock source, users can select from one of two options:

Manually Time Settings: Users input the system time manually.

Sync To PC: The system time will be synchronized from the local computer.

Click **Apply** to make the change effective.

L2 Functions > SNTP > TimeZone Settings

The TimeZone Setting Page is used to configure time zones and Daylight Savings time settings for SNTP.

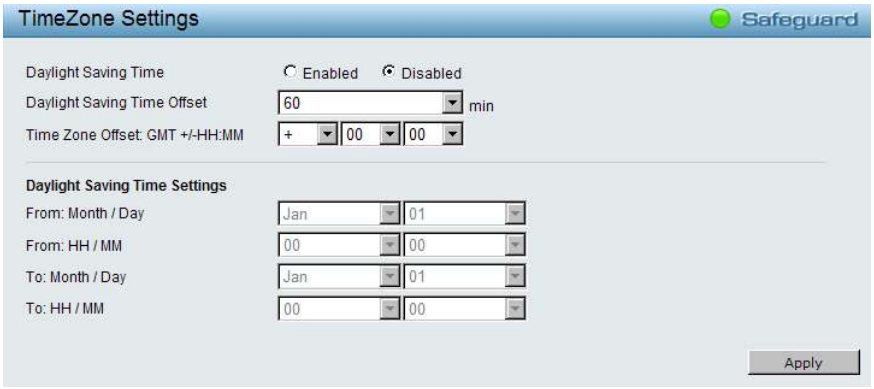


Figure 5.55 – L2 Functions > SNTP > TimeZone Settings

Daylight Saving Time State: Enable or disable the DST Settings.

Daylight Saving Time Offset: Use this drop-down menu to specify the amount of time that will constitute your local DST offset - *30*, *60*, *90*, or *120* minutes.

Time Zone Offset GMT +/- HH:MM: Use these drop-down menus to specify your local time zone's offset from Greenwich Mean Time (GMT.)

Daylight Saving Time Settings:

From: Month / Day: Enter the month DST and date DST will start on, each year.

From: HH:MM: Enter the time of day that DST will start on, each year.

To: Month / Day: Enter the month DST and date DST will end on, each year.

To: HH:MM: Enter the time of day that DST will end on, each year.

Click **Apply** to implement changes made.

L2 Functions > LLDP > LLDP Global Settings

LLDP (Link Layer Discovery Protocol) provides IEEE 802.1AB standards-based method for switches to advertise themselves to neighbor devices, as well as to learn about neighbor LLDP devices. SNMP utilities can learn the network topology by obtaining the MIB information in each LLDP device. The LLDP function is enabled by default.

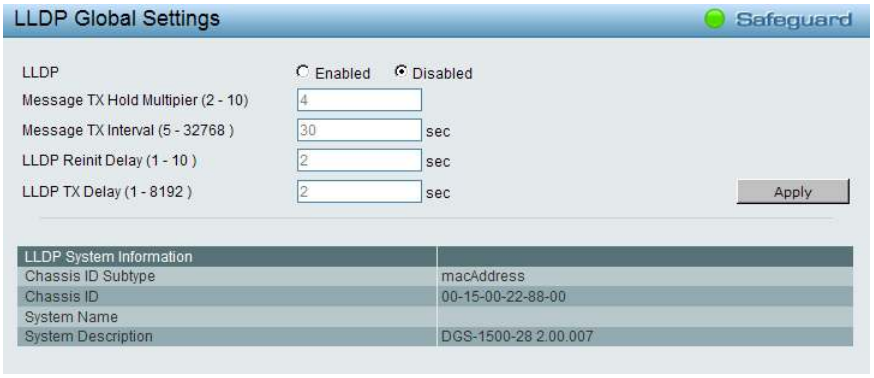


Figure 5.56 –L2 Functions> LLDP > LLDP Global Settings

LLDP: When this function is *Enabled*, the switch can start to transmit, receive and process the LLDP packets. For the advertisement of LLDP packets, the switch announces the information to its neighbor through ports. For the receiving of LLDP packets, the switch will learn the information from the LLDP packets advertised from the neighbor in the neighbor table. Click **Apply** to make the change effective.

Message TX Hold Multiplier (2-10): This parameter is a multiplier that determines the actual TTL value used in an LLDPDU. The default value is **4**.

Message TX Interval (5-32768): This parameter indicates the interval at which LLDP frames are transmitted on behalf of this LLDP agent. The default value is **30** seconds.

LLDP ReInit Delay (1-10): This parameter indicates the amount of delay from the time adminStatus becomes "disabled" until re-initialization is attempted. The default value is **2** seconds.

LLDP TX Delay (1-8192): This parameter indicates the delay between successive LLDP frame transmissions initiated by value or status changes in the LLDP local systems MIB. The value for txDelay is set by the following range formula: 1 < txDelay < (0.25 °— msgTxInterval). The default value is **2** seconds.

L2 Functions > LLDP > LLDP Port Settings

The Basic LLDP Port Settings page displays LLDP port information and contains parameters for configuring LLDP port settings.

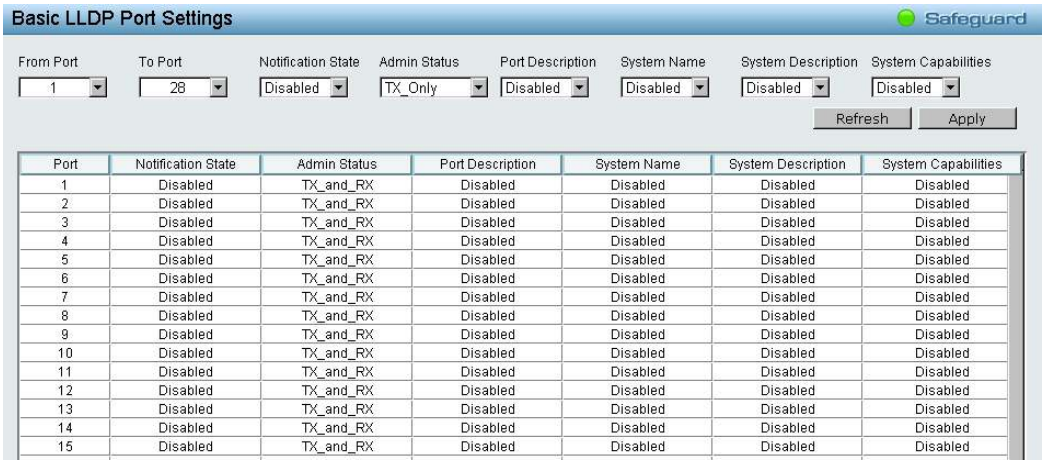


Figure 5.57 –L2 Functions> LLDP > LLDP Port Settings

From Port/ To Port: A consecutive group of ports may be configured starting with the selected port.

Notification State: Specifies whether notification is sent when an LLDP topology change occurs on the port. The possible field values are:

Enabled – Enables LLDP notification on the port.

Disabled – Disables LLDP notification on the port. This is the default value.

Admin Status: Specifies the LLDP transmission mode on the port. The possible field values are:

TX_Only – Enables transmitting LLDP packets only.

RX_Only – Enables receiving LLDP packets only.

TX_and_RX – Enables transmitting and receiving LLDP packets. This is the default.

Disabled – Disables LLDP on the port.

Port Description: Specifies whether the Port Description TLV is enabled on the port. The possible field values are:

Enabled – Enables the Port Description TLV on the port.

Disabled – Disables the Port Description TLV on the port.

System Name: Specifies whether the System Name TLV is enabled on the port. The possible field values are:

Enabled – Enables the System Name TLV on the port.

Disabled – Disables the System Name TLV on the port.

System Description: Specifies whether the System Description TLV is enabled on the port. The possible field values are:

Enabled – Enables the System Description TLV on the port.

Disabled – Disables the System Description TLV on the port.

System Capabilities: Specifies whether the System Capabilities TLV is enabled on the port. The possible field values are:

Enabled – Enables the System Capabilities TLV on the port.

Disabled – Disables the System Capabilities TLV on the port.

Define these parameter fields. Click **Apply** to implement changes made and click **Refresh** to refresh the table information.

L2 Functions > LLDP > 802.1 Extension TLV

This 802.1 Extension TLV page is used to configure the LLDP Port settings.

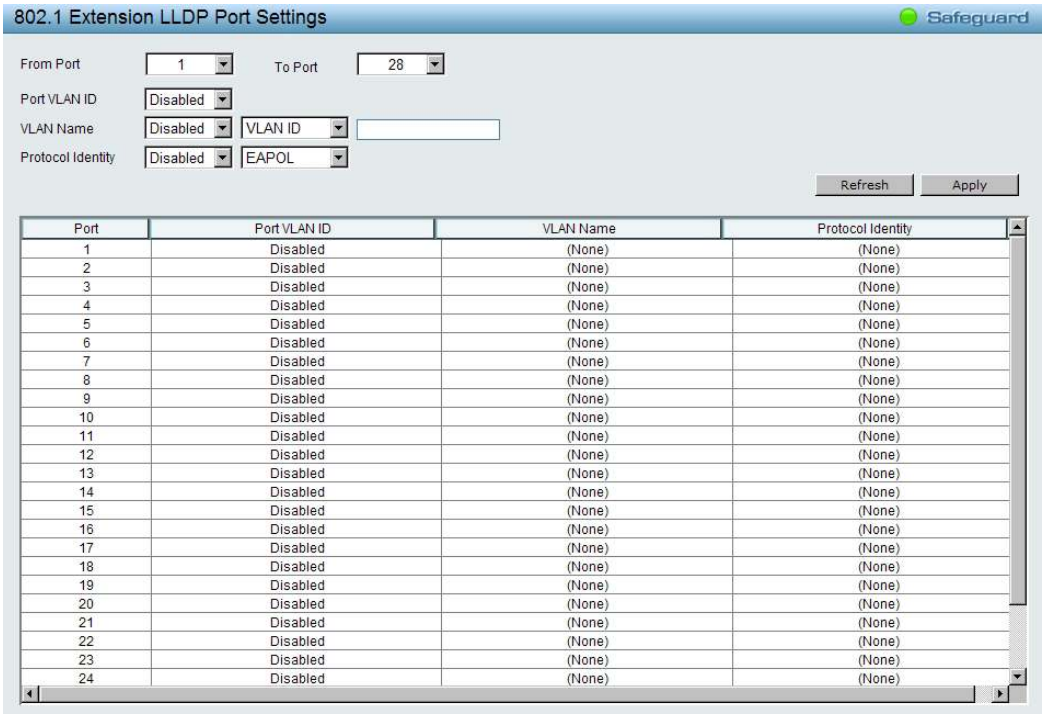


Figure 5.58 – L2 Functions > LLDP > 802.1 Extension TLV

From Port / To Port : A consecutive group of ports may be configured starting with the selected port.

Port VLAN ID : Specifies the Port VLAN ID to be enabled or disabled.

VLAN Name : Specifies the VLAN name to be enabled or disabled in the LLDP port. If select Enabled, users can specifies the content of VLAN ID or VLAN Name or all.

Protocol Identity : Specifies the Protocol Identity to be enabled or disabled in the LLDP port. If select Enabled, users can specifies the EAPOL, LACP, GVRP, STP or ALL.

Click **Apply** to implement changes made and click **Refresh** to refresh the table information.

L2 Functions > LLDP > 802.3 Extension TLV

The 802.3 Extension LLDP Port Settings page displays 802.3 Extension LLDP port information and contains parameters for configuring 802.3 Extension LLDP port settings.

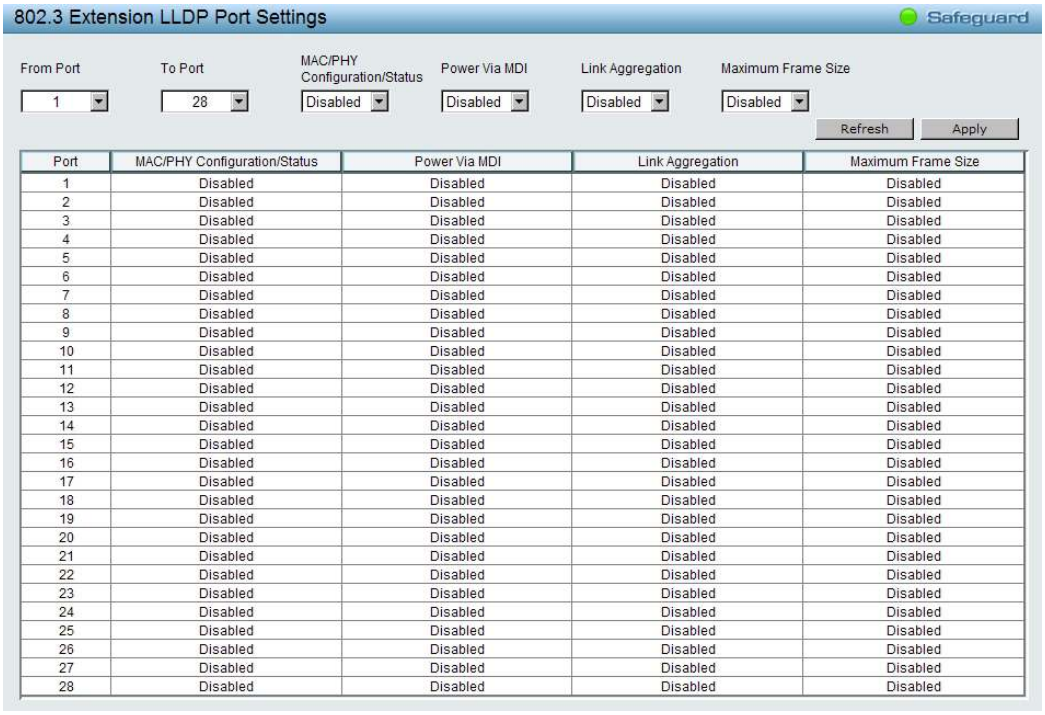


Figure 5.59 – L2 Functions > LLDP > 802.3 extension TLV

From Port/To Port: A consecutive group of ports may be configured starting with the selected port.

MAC/PHY Configuration/Status: Specifies whether the MAC/PHY Configuration Status is enabled on the port. The possible field values are:

Enabled – Enables the MAC/PHY Configuration Status on the port.

Disabled – Disables the MAC/PHY Configuration Status on the port.

Power via MDI: Advertises the Power via MDI implementations supported by the port. The possible field values are:

Enabled – Enables the Power via MDI configured on the port.

Disabled – Disables the Power via MDI configured on the port.

Link Aggregation: Specifies whether the link aggregation is enabled on the port. The possible field values are:

Enabled – Enables the link aggregation configured on the port.

Disabled – Disables the link aggregation configured on the port.

Maximum Frame Size: Specifies whether the Maximum Frame Size is enabled on the port. The possible field values are:

Enabled – Enables the Maximum Frame Size configured on the port.

Disabled – Disables the Maximum Frame Size configured on the port.

Define these parameter fields. Click **Apply** to implement changes made and click **Refresh** to refresh the table information.

L2 Functions > LLDP > LLDP Management Address Settings

The LLDP Management Address Settings allows the user to set management address which is included in LLDP information transmitted.

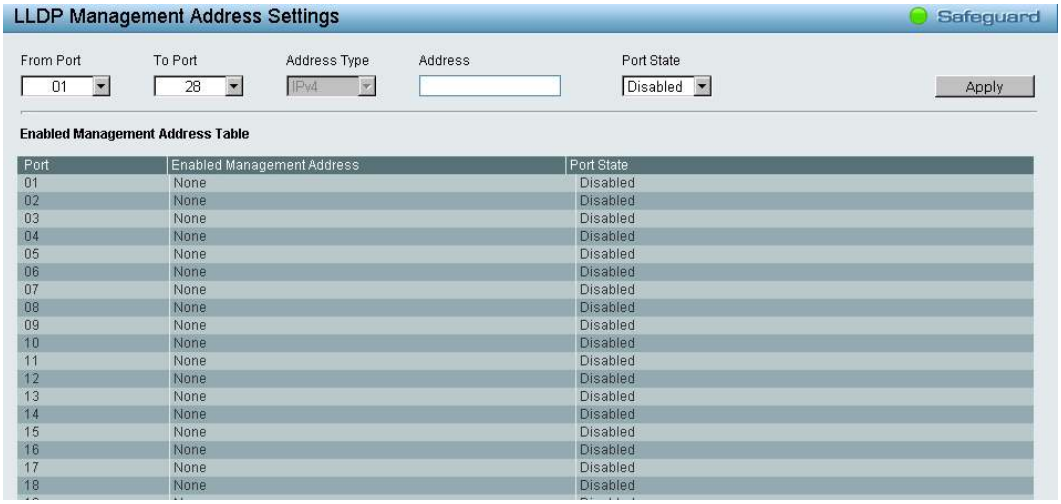


Figure 5.60 – L2 Functions > LLDP >LLDP Management Address Settings

From Port/To Port: A consecutive group of ports may be configured starting with the selected port.

Address Type: Specify the LLDP address type on the port. The value is always IPv4.

Address: Specify the address.

Port State: Specify whether the Port State is enabled n the port. The possible field values are:

Enabled – Enables the port state configured on the port.

Disabled – Disables the port state configured on the port.

Click **Apply** to implement changes made.

L2 Functions > LLDP > LLDP Management Address Table

The LLDP Management Address Table page displays the detailed management address information for the entry.

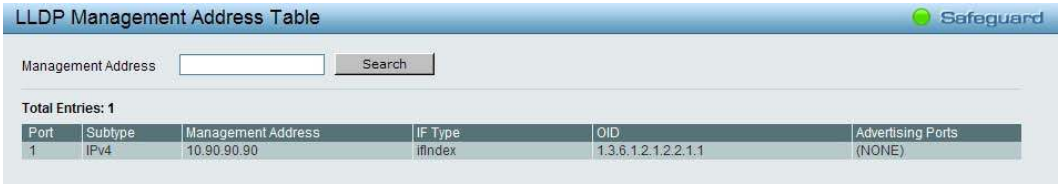


Figure 5.61 – L2 Functions > LLDP >LLDP Management Address Table

Management Address: Specifies IPv4 or MAC address then enter the address. Click **Search** and the table will update and display the values required.

Subtype: Displays the managed address subtype. For example, MAC or IPv4.

Management Address: Displays the IP address.

IF Type: Displays the IF Type.

OID: Displays the SNMP OID.

Advertising Ports: Displays the advertising ports.

L2 Functions > LLDP > LLDP Local Port Table

The LLDP Local Port Table page displays LLDP local port information.

Port	Port ID Subtype	Port ID	Port Description	Normal	Detailed
1	Interface Alias	Slot0/0	Ethernet Interface	View	View
1	Interface Alias	Slot0/1	Ethernet Interface	View	View
1	Interface Alias	Slot0/2	Ethernet Interface	View	View
1	Interface Alias	Slot0/3	Ethernet Interface	View	View
1	Interface Alias	Slot0/4	Ethernet Interface	View	View
1	Interface Alias	Slot0/5	Ethernet Interface	View	View
1	Interface Alias	Slot0/6	Ethernet Interface	View	View
1	Interface Alias	Slot0/7	Ethernet Interface	View	View
1	Interface Alias	Slot0/8	Ethernet Interface	View	View
1	Interface Alias	Slot0/9	Ethernet Interface	View	View
1	Interface Alias	Slot0/10	Ethernet Interface	View	View
1	Interface Alias	Slot0/11	Ethernet Interface	View	View
1	Interface Alias	Slot0/12	Ethernet Interface	View	View
1	Interface Alias	Slot0/13	Ethernet Interface	View	View
1	Interface Alias	Slot0/14	Ethernet Interface	View	View
1	Interface Alias	Slot0/15	Ethernet Interface	View	View
1	Interface Alias	Slot0/16	Ethernet Interface	View	View
1	Interface Alias	Slot0/17	Ethernet Interface	View	View
1	Interface Alias	Slot0/18	Ethernet Interface	View	View
1	Interface Alias	Slot0/19	Ethernet Interface	View	View
1	Interface Alias	Slot0/20	Ethernet Interface	View	View
1	Interface Alias	Slot0/21	Ethernet Interface	View	View
1	Interface Alias	Slot0/22	Ethernet Interface	View	View
1	Interface Alias	Slot0/23	Ethernet Interface	View	View
1	Interface Alias	Slot0/24	Ethernet Interface	View	View
1	Interface Alias	Slot0/25	Ethernet Interface	View	View
1	Interface Alias	Slot0/26	Ethernet Interface	View	View
1	Interface Alias	Slot0/27	Ethernet Interface	View	View

Figure 5.62 – L2 Functions > LLDP > LLDP Port Settings

Port : Displays the port number.

Port ID Subtype: Displays the port ID subtype.

Port ID: Displays the port ID (Unit number/Port number).

Port Description: Displays the port description.

Click **View** Normal or Detailed to displays more information.

L2 Functions > LLDP > LLDP Remote Port Table

This LLDP Remote Port Table page is used to display the LLDP Remote Port Brief Table. Select port number and click **Search** to display additional information.

Figure 5.63 – L2 Functions > LLDP > LLDP Remote Port Table

To view the settings for a remote port, click **View Normal** and the following page displays.

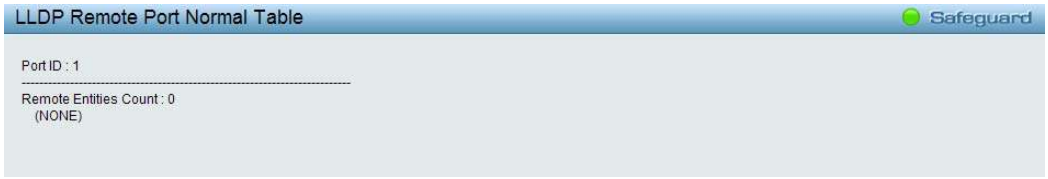


Figure 5.64 – L2 Functions > LLDP > LLDP Remote Port Table(Normal)

To view the detail settings for a remote port, click **View Detailed** and the following page displays.

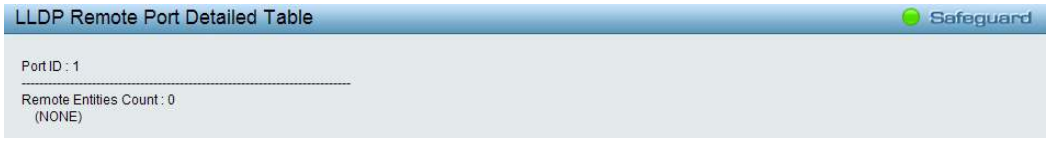


Figure 5.65 – L2 Functions > LLDP > LLDP Remote Port Table(Detailed)

L2 Functions > LLDP > LLDP Statistics

The LLDP Statistics page displays an overview of all LLDP traffic.

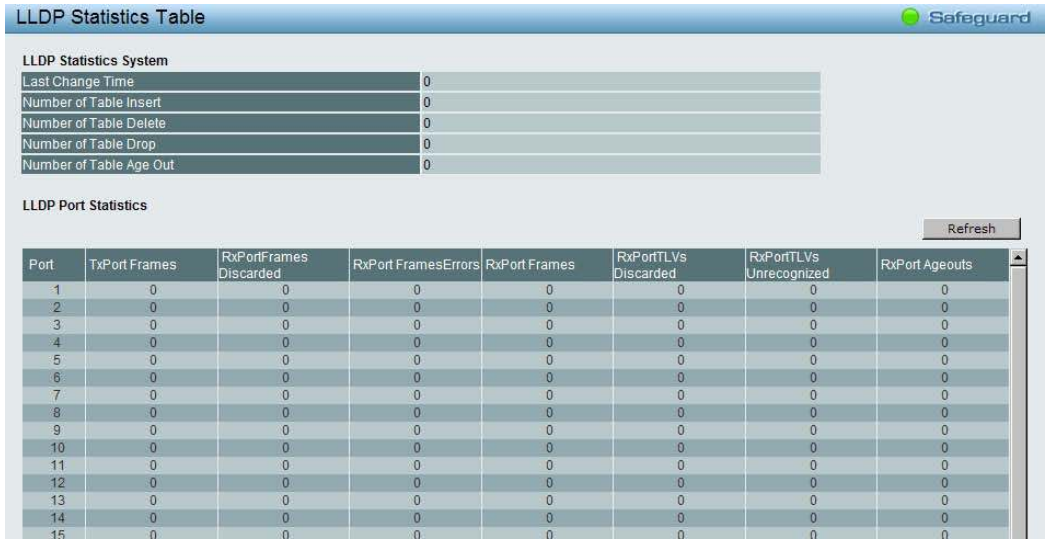

LLDP Statistics Table
Safeguard
LLDP Statistics System
Last Change Time 0
Number of Table Insert 0
Number of Table Delete 0
Number of Table Drop 0
Number of Table Age Out 0
LLDP Port Statistics
Refresh
Port TxPort Frames RxPortFrames Discarded RxPort FramesErrors RxPort Frames RxPortTLVs Discarded RxPortTLVs Unrecognized RxPort Ageouts
1 0 0 0 0 0 0 0
2 0 0 0 0 0 0 0
3 0 0 0 0 0 0 0
4 0 0 0 0 0 0 0
5 0 0 0 0 0 0 0
6 0 0 0 0 0 0 0
7 0 0 0 0 0 0 0
8 0 0 0 0 0 0 0
9 0 0 0 0 0 0 0
10 0 0 0 0 0 0 0
11 0 0 0 0 0 0 0
12 0 0 0 0 0 0 0
13 0 0 0 0 0 0 0
14 0 0 0 0 0 0 0
15 0 0 0 0 0 0 0

Figure 5.66 – L2 Functions > LLDP > LLDP Statistics

The following information can be viewed:

LLDP Statistics System: Displays the counters that refer to the whole switch.

Last Change Time – Displays the time for when the last change entry was last deleted or added. It is also displays the time elapsed since last change was detected.

Number of Table Insert – Displays the number of new entries inserted since switch reboot.

Number of Table Delete – Displays the number of new entries deleted since switch reboot.

Number of Table Drop – Displays the number of LLDP frames dropped due to that the table was full.

Number of Table Age Out – Displays the number of entries deleted due to Time-To-Live expiring.

LLDP Port Statistics: Displays the counters that refer to the ports.

TxPort FramesTotal – Displays the total number of LLDP frames transmitted on the port.

RxPort FramesDiscarded – Displays the total discarded frame number of LLDP frames received on the port.

RxPort FramesErrors – Displays the Error frame number of LLDP frames received on the port.

RxPort Frames – Displays the total number of LLDP frames received on the port.

RxPortTLVsDiscarded – Each LLDP frame can contain multiple pieces of information, known as TLVs. If a TLV is malformed, it is counted and discarded.

RxPortTLVsUnrecognized – Displays the number of well-formed TLVs, but with an known type value.

RxPort Ageouts – Each LLDP frame contains information about how long time the LLDP information is valid. If no new LLDP frame is received within the age out time, the LLDP information is removed, and the Age-Out counter is incremented.

L3 Functions > IP Interface

The IP Interface page provides user to configure the IP Interface settings.

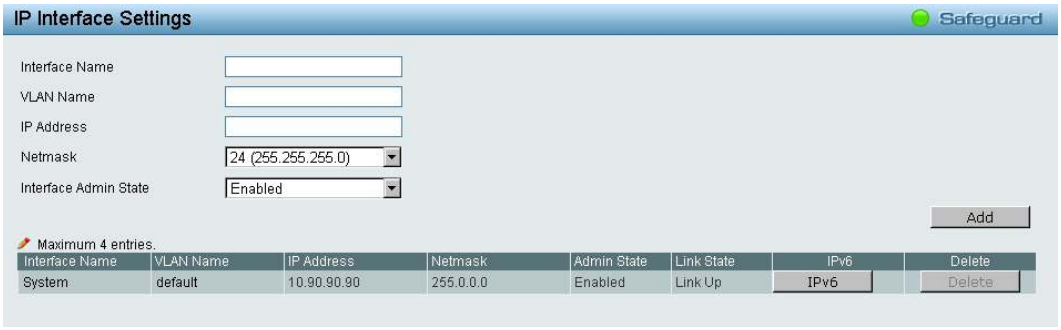


Figure 5.67 – L3 Functions > IP Interface

Interface Name: Specifies the name of IP interface.

VLAN Name: Specifies the VLAN name of IP interface.

IP Address: Specifies the IP address for the interface.

Netmask: Select the netmask of IP address.

Interface Admin State: Enables or disables the interface administration state.

Click **Add** for the settings to take effect.

L3 Functions > IPv6 Neighbor Settings

The user can configure the Switch's IPv6 neighbor settings. The Switch's current IPv6 neighbor settings will be displayed in the table at the bottom of this window.

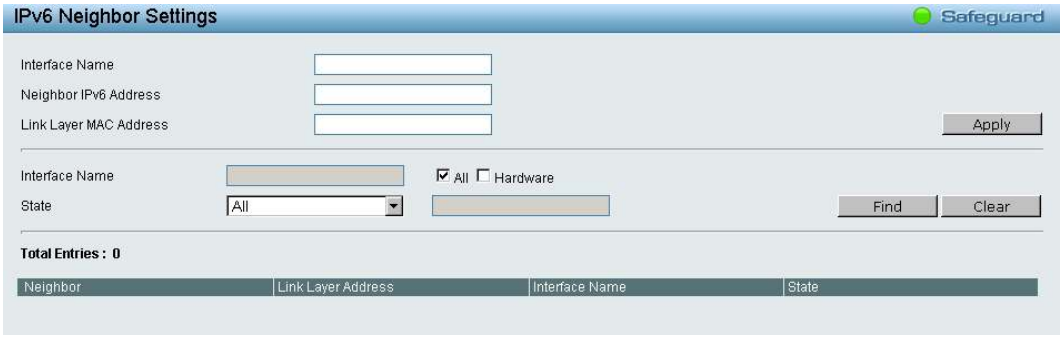


Figure 5.68 – L3 Functions > IP v6 Neighbor Settings

Interface Name: Enter the interface name of the IPv6 neighbor.

Neighbor IPv6 Address: Specifies the neighbor IPv6 address.

Link Layer MAC Address: Specifies the link layer MAC address.

Click **Add** for the settings to take effect.

Interface Name: Specifies the interface name of the IPv6 neighbor. To search for all the current interfaces on the Switch, go to the second Interface Name field in the middle part of the window, tick the All check box. Tick the Hardware option to display all the neighbor cache entries which were written into the hardware table.

State: Use the drop-down menu to select All, Address, Static or Dynamic. When the user selects address from the drop-down menu, the user will be able to enter an IP address in the space provided next to the state option.

Click **Add** to add a new entry based on the information entered.

Click **Find** to locate a specific entry based on the information entered.

Click **Clear** to clear all the information entered in the fields.

L3 Functions > Static Route

The Static Route page provides user to configure the IPv4 Static Route settings.

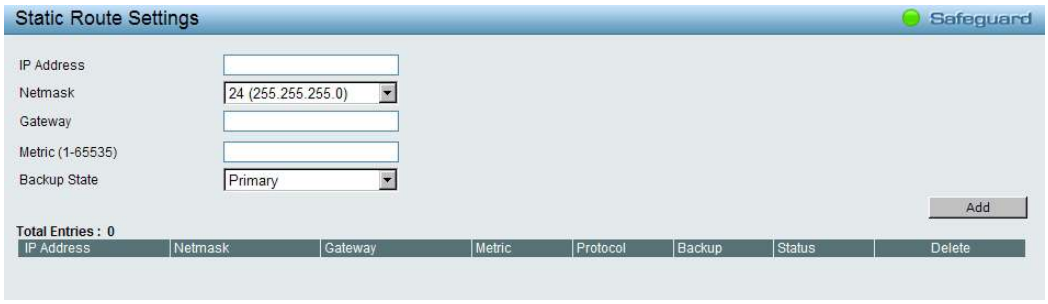


Figure 5.69 – L3 Functions > Static Route

IP Address: Specifies the IPv4 address of the Static Route.

Netmask: Specifies the Netmask of the IPv4 address entered into the Static Route table.

Gateway: Specifies the corresponding Gateway of the IP address entered into the Static Route table.

Metric (1-65535): Represents the metric value of the IP interface entered into the table. This field may read a number between 1-65535 for an OSPF setting, and 1-16 for a RIP setting.

Backup State: The user may choose between *Primary* and *Backup.* If the Primary Static Route fails, the Backup Route will support the entry. Please take note that the Primary and Backup entries cannot have the same Gateway.

Click **Add** for the settings to take effect.

L3 Functions > Routing Table Finder

The Routing Table Finder page shows the current IPv4 routing table of the Switch. To find a specific IPv4 route, enter an IPv4 address into the **Network Address** field and click **Search**.

Figure 5.70 – L3 Functions > Routing Table Finder

L3 Functions > IPv6 Static Route

The IPv6 Static Route page allows user to configure the IPv6 settings.

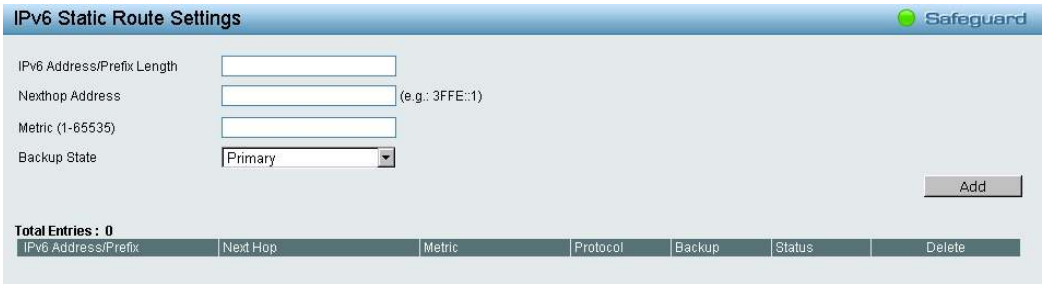


Figure 5.71 – L3 Functions > IPv6 Static Route

Ipv6 Address/Prefix Length: Specify that packets matching that address will be translated.

Nexthop Address: Specify the next hop IP address.

Metric (1 - 65535): Represents the metric value of the IP interface entered into the table. This field may read a number between 1 and 65535.

Backup State: Each IP address can only have one primary route, while other routes should be assigned to the backup state. When the primary route failed, switch will try the backup routes according to the order learnt by the routing table until route success. The field represents the Backup state that the Static and Default Route is configured for.

Click **Add** to create a new IPv6 Static Route.

L3 Functions > IPv6 Routing Table Finder

The IPv6 Routing Table Finder page shows the current IPv6 routing table of the Switch. To find a specific IPv6 route, enter an IPv6 address into the **IPv6 Network Address** field and click **Search**.

Figure 5.72 – L3 Functions > IPv6 Routing Table Finder

IPv6 Network Address: Specify the IPv6 address.

NOTE: The Static Route settings and Routing Table Finder of IPv4 / IPv6 need to be configured with different setting pages.

L3 Functions > ARP > ARP Table Global Settings

The ARP Table Global Settings page allows network managers to view, define, modify and delete ARP information for specific devices. When static entries are defined, a permanent entry is entered and is used to translate IP address to MAC addresses.

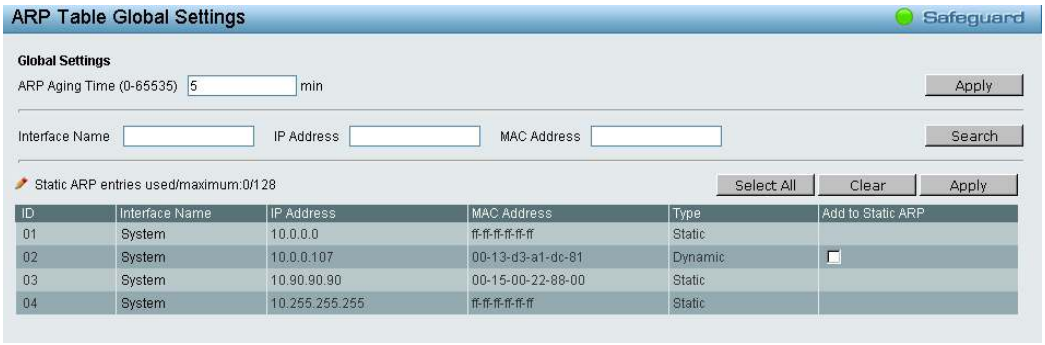


Figure 5.73 – L3 Functions > ARP > ARP Table Global Settings

ARP Aging Time (0-65535): Specifies the aging time of the ARP entry. The default is 5 minutes.

Click **Apply** for the settings to take effect.

Add Static ARP Entry:

Interface Name: Specifies the interface name of the ARP entry.

IP Address: Specifies the IP address of the ARP entry.

MAC Address: Specifies the MAC address of the ARP entry.

Click **Search** to find an ARP entry of the Switch or click Apply to create a new ARP entry.

Click **Select All** to check all ARP entries then click **Clear** to delete the information of ARP entry table.

Select the check box of **Add to Static ARP** column then click **Apply** to make effect.

L3 Functions > ARP > Static ARP Settings

The Static ARP Settings page provides information regarding Interface Name, including which IP address was mapped to what MAC address. Entered **IP Address** or **MAC Address** then click **Add** to create a new ARP entry of ARP table.

Figure 5.74 – L3 Functions > ARP > Static ARP Settings

Click **Delete** or **Delete All** to delete the information of ARP table.

L3 Functions > ARP > Gratuitous ARP

The Gratuitous ARP page provides users to configure the Gratuitous ARP global settings.

Figure 5.75 – L3 Functions > ARP > Gratuitous ARP

Specifies the **Send when IP Interface is up**, **Send when duplicated IP is detected** and **Learn received Gratuitous ARP** are enabled or disabled then click **Apply** to take effect.

Gratuitous ARP Send Interval:

Interface Name: Specifies the Interface Name of Gratuitous ARP.

Time Interval (0-65535): Specifies the time interval for Gratuitous ARP.

Click **Apply** for the settings to take effect.

L3 Functions > Single IP Management > SIM Global Settings

All switches are set as Candidate switches (CaS) as their factory default configuration and Single IP Management will be disabled. The SIM Global Settings page provides user to change the device to be single IP management.

Figure 5.76 – L3 Functions > Single IP Management > SIM Global Settings

SIM: enable or disable the SIM state on the Switch. *Disabled* will render all SIM functions on the Switch inoperable.

Role State: There are two states for the Role: Commander and Candidate.

Commander: Choosing this parameter will make the Switch a Commander Switch (CS). The user may join other switches to this Switch, over Ethernet, to be part of its SIM group. Choosing this option will also enable the Switch to be configured for SIM.

Candidate: A Candidate Switch (CaS) is not the member of a SIM group but is connected to a Commander Switch. This is the default setting for the SIM role.

Discovery Interval (30-90): The user may set the discovery protocol interval, in seconds that the Switch will send out discovery packets. Returning information to a Commander Switch will include information about other switches connected to it. (Ex. MS, CaS). The user may set the **Discovery Interval** from 30 to 90 seconds.

Hold Time (100-255): This parameter may be set for the time, in seconds the Switch will hold information sent to it from other switches, utilizing the **Discovery Interval**. The user may set the hold time from 100 to 255 seconds.

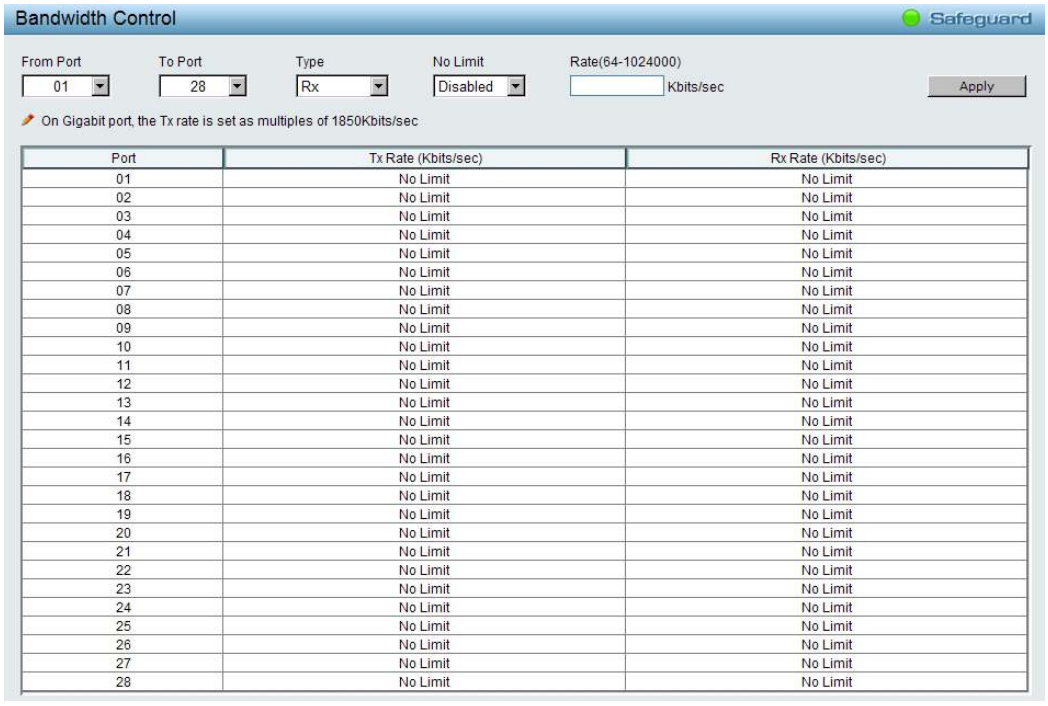
Click **Apply** for the settings to take effect.

NOTE: The function does not work with management switch.

NOTE: The Single IP Management feature supports IPv4 and IPv6.

QoS > Bandwidth Control

The Bandwidth Control page allows network managers to define the bandwidth settings for a specified port's transmitting and receiving data rates.



Port	Tx Rate (Kbits/sec)	Rx Rate (Kbits/sec)
01	No Limit	No Limit
02	No Limit	No Limit
03	No Limit	No Limit
04	No Limit	No Limit
05	No Limit	No Limit
06	No Limit	No Limit
07	No Limit	No Limit
08	No Limit	No Limit
09	No Limit	No Limit
10	No Limit	No Limit
11	No Limit	No Limit
12	No Limit	No Limit
13	No Limit	No Limit
14	No Limit	No Limit
15	No Limit	No Limit
16	No Limit	No Limit
17	No Limit	No Limit
18	No Limit	No Limit
19	No Limit	No Limit
20	No Limit	No Limit
21	No Limit	No Limit
22	No Limit	No Limit
23	No Limit	No Limit
24	No Limit	No Limit
25	No Limit	No Limit
26	No Limit	No Limit
27	No Limit	No Limit
28	No Limit	No Limit

Figure 5.77 – QoS > Bandwidth Control

From Port / To Port: A consecutive group of ports may be configured starting with the selected port.

Type: This drop-down menu allows you to select between *RX* (receive), *TX* (transmit), and *Both*. This setting will determine whether the bandwidth ceiling is applied to receiving, transmitting, or both receiving and transmitting packets.

No Limit: This drop-down menu allows you to specify that the selected port will have no bandwidth limit.

Enabled disables the limit.

Rate (64-1024000): This field allows you to enter the data rate, in Kbits per second, will be the limit for the selected port. The value is between 64 and 1024000.

Click **Apply** to set the bandwidth control for the selected ports.

QoS > 802.1p/DSCP/ToS

QoS is an implementation of the IEEE 802.1p standard that allows network administrators to reserve bandwidth for important functions that require a larger bandwidth or that might have a higher priority, such as VoIP (voice-over Internet Protocol), web browsing applications, file server applications or video conferencing. Thus with larger bandwidth, less critical traffic is limited, and therefore excessive bandwidth can be saved.

The following figure displays the status of Quality of Service priority levels of each port, higher priority means the traffic from this port will be first handled by the switch. For packets that are untagged, the switch will assign the priority depending on your configuration.

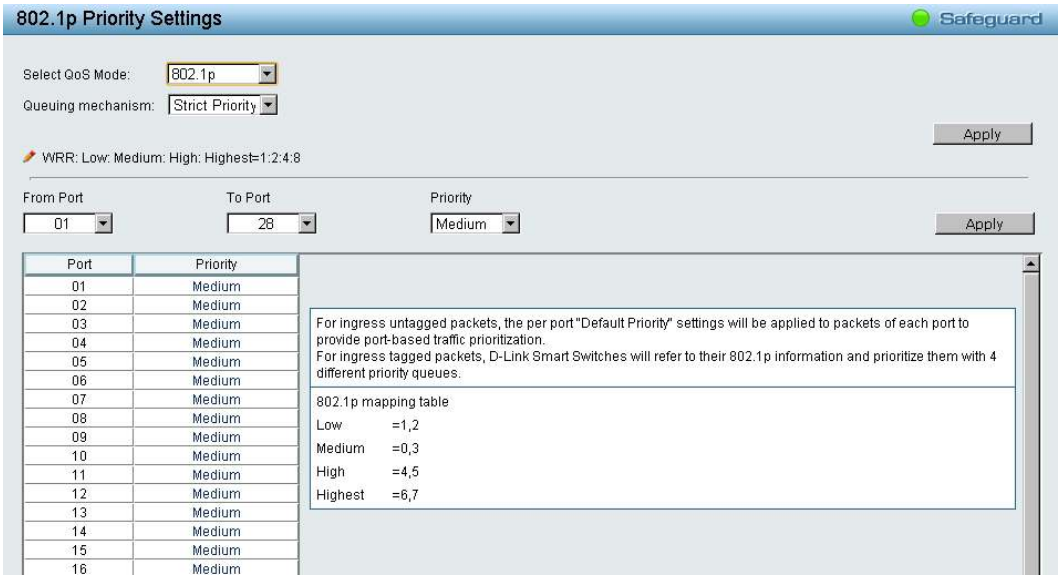


Figure 5.78 – QoS > 802.1p/DSCP/ToS

Select QoS Mode: Specifies the QoS mode to be 802.1p, DSCP or ToS.

Queuing Mechanism:

Strict Priority: Denoting a Strict scheduling will set the highest queue to be emptied first while the other queues will follow the weighted round-robin scheduling scheme

WRR: Use the weighted round-robin (WRR) algorithm to handle packets in an even distribution in priority classes of service.

Click **Apply** for the settings to take effect.

From Port / To Port: Defines the port range which the port packet priorities are defined.

Priority: Defines the priority assigned to the port. The priorities are Highest, High, Medium and Low.

Click **Apply** for the settings to take effect.

QoS > TCP/UDP Port Priority Settings

When using the TCP/UDP Port Priority mechanism, the packet is classified based on the TCP/UDP field priority in the TCP/UDP priority table entries. The TCP/UDP port number now supports with IPv0034.

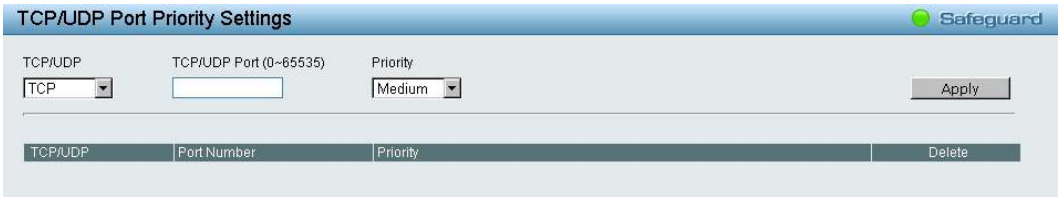


Figure 5.79 – QoS > TCP/UDP Port Priority Settings

TCP/UDP: Specify the port priority to be TCP or UDP.

TCP/UDP Port (0-65535): Specify the TCP/UDP port number.

Priority: Defines the priority assigned to the port. The priorities are Highest, High, Medium and Low.

Click **Apply** for the settings to take effect.

QoS > IPv6 Traffic Class Priority Settings

The IPv6 Traffic Class Priority Settings page allows user to configure the priority of traffic class.

Figure 5.80 – QoS > IPv6 Traffic Class Priority Settings

IPv6 Traffic Class (0-255): Specify the value of IPv6 class.

Priority: Defines the priority assigned to the port. The priorities are Highest, High, Medium and Low.

Click **Apply** for the settings to take effect.

Security > Trusted Host

Use Trusted Host function to manage the switch from a remote station. You can enter up to ten designated management stations networks by defining the IPv4 Address/Netmask or IPv6 Address/Prefix as seen in the figure below.

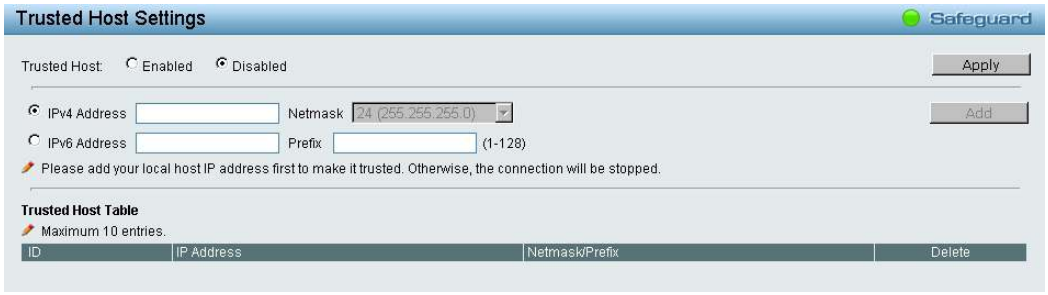


Figure 5.81 Security > Trusted Host

Click **Apply** to enable or disable the Trusted Host feature. Type in the IP Address and select Netmask then click **Add** button to create a Trusted Host IP.

To delete the IP address, simply click the **Delete** button.

Security > Port Security

Port Security is a security feature that prevents unauthorized computers (with source MAC addresses) unknown to the Switch prior to stopping auto-learning processing from gaining access to the network.

A given ports' (or a range of ports') dynamic MAC address learning can be stopped such that the current source MAC addresses entered into the MAC address forwarding table can not be changed once the port

lock is enabled. Using the drop-down menu, change **Admin State** to *Enabled*, and then click **Apply** to confirm the setting.

Figure 5.82 – Security > Port Security

Security > Traffic Segmentation

This feature provides administrators to limit traffic flow from a single port to a group of ports on a single Switch. This method of segmenting the flow of traffic is similar to using VLANs to limit traffic, but is more restrictive.

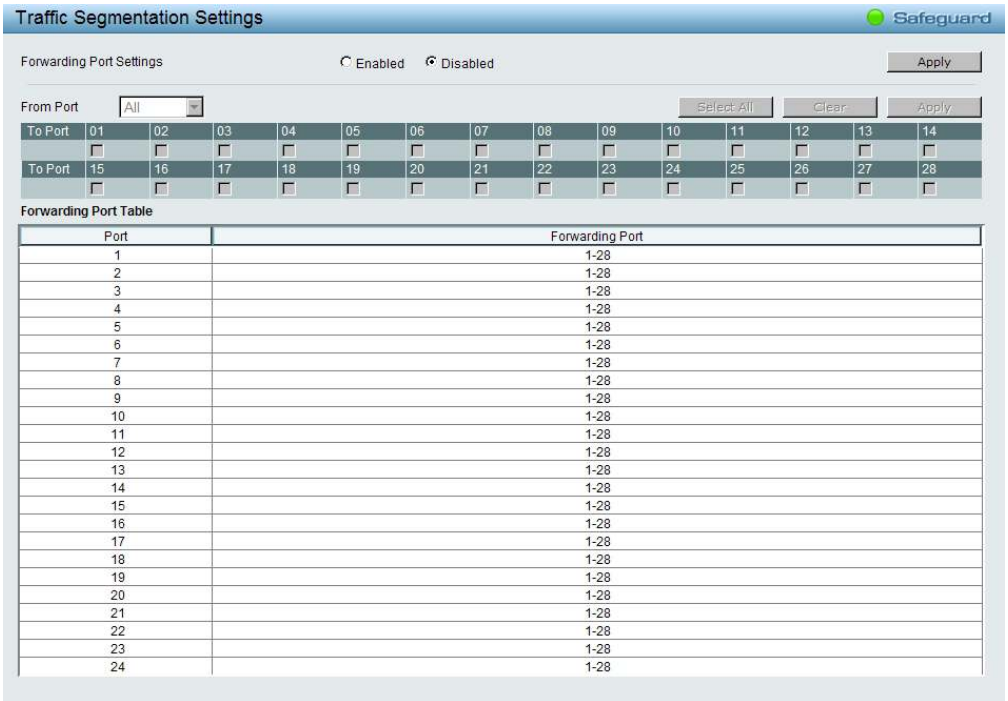


Figure 5.83 – Security > Traffic Segmentation

Click **Apply** to enable or disable this feature.

To configure traffic segmentation specify a port or All ports from the switch, using the **From Port** pull-down menu and select To Port then click **Apply** to enter the settings into the Switch's **Traffic Segmentation** table. Click **Select All** button to check all ports or click **Clear** button to uncheck all ports.

Security > Safeguard Engine

D-Link's **Safeguard Engine** is a robust and innovative technology that automatically throttles the impact of packet flooding into the switch's CPU. This function helps to protect the Web-Smart Switch from being interrupted by malicious viruses or worm attacks. This option is enabled by default.

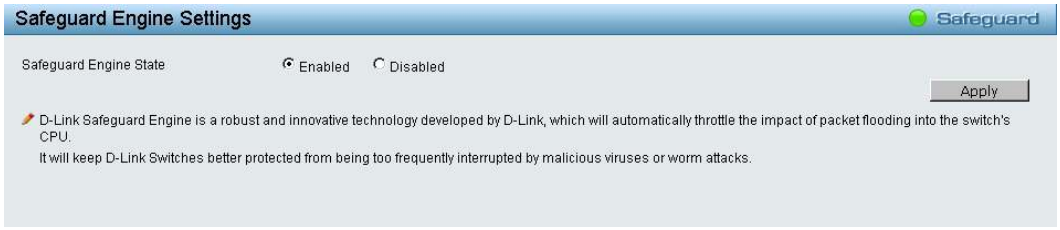

Safeguard Engine Settings
Safeguard
Safeguard Engine State
Enabled
Disabled
Apply
D-Link Safeguard Engine is a robust and innovative technology developed by D-Link, which will automatically throttle the impact of packet flooding into the switch's CPU.
It will keep D-Link Switches better protected from being too frequently interrupted by malicious viruses or worm attacks.

Figure 5.84 – Security > Safeguard Engine

Security > Storm Control

The Storm Control feature provides the ability to control the receive rate of broadcast, multicast, and unknown unicast packets. Once a packet storm has been detected, the Switch will drop packets coming into the Switch until the storm has subsided.

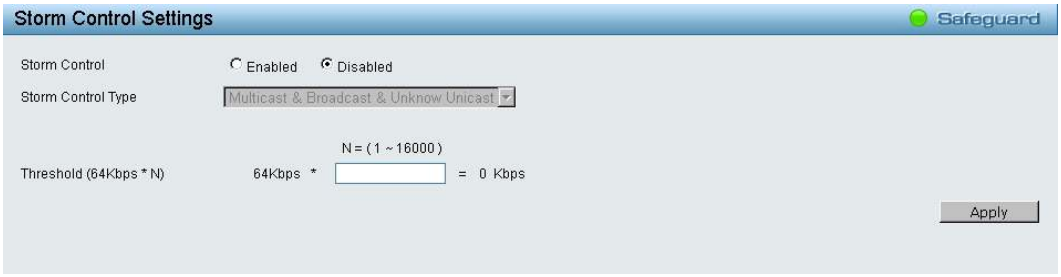


Figure 5.85 – Security > Storm Control

Storm Control Type: User can select the different Storm type from **Broadcast Only**, **Multicast & Broadcast** and **Broadcast & Multicast & Unknown Unicast**.

Threshold: If storm control is enabled (default is disabled), the threshold can be set here. The threshold is from of *64 ~ 1,024,000* Kbit per second, with steps (N) of 64Kbps. N can be from 1 to *16000*.

Click **Apply** for the settings to take effect.

Security > ARP Spoofing Prevention

ARP spoofing, also known as ARP poisoning, is a method to attack an Ethernet network by allowing an attacker to sniff data frames on a LAN, modifying the traffic, or stopping the traffic (known as a Denial of Service – DoS attack). The main idea of ARP spoofing is to send fake or spoofed ARP messages to an Ethernet network. It associates the attacker's or random MAC address with the IP address of another node such as the default gateway. Any traffic meant for that IP address would be mistakenly re-directed to the node specified by the attacker.

A common DoS attack today can be done by associating a nonexistent or specified MAC address to the IP address of the network's default gateway. The malicious attacker only needs to broadcast one gratuitous ARP to the network claiming to be the gateway, so that the whole network operation is turned down as all packets to the Internet will be directed to the wrong node.

The ARP Spoofing Prevention function can discard the ARP Spoofing Attack in the network by checking the gratuitous ARP packets and filtering those with illegal IP or MAC addresses.

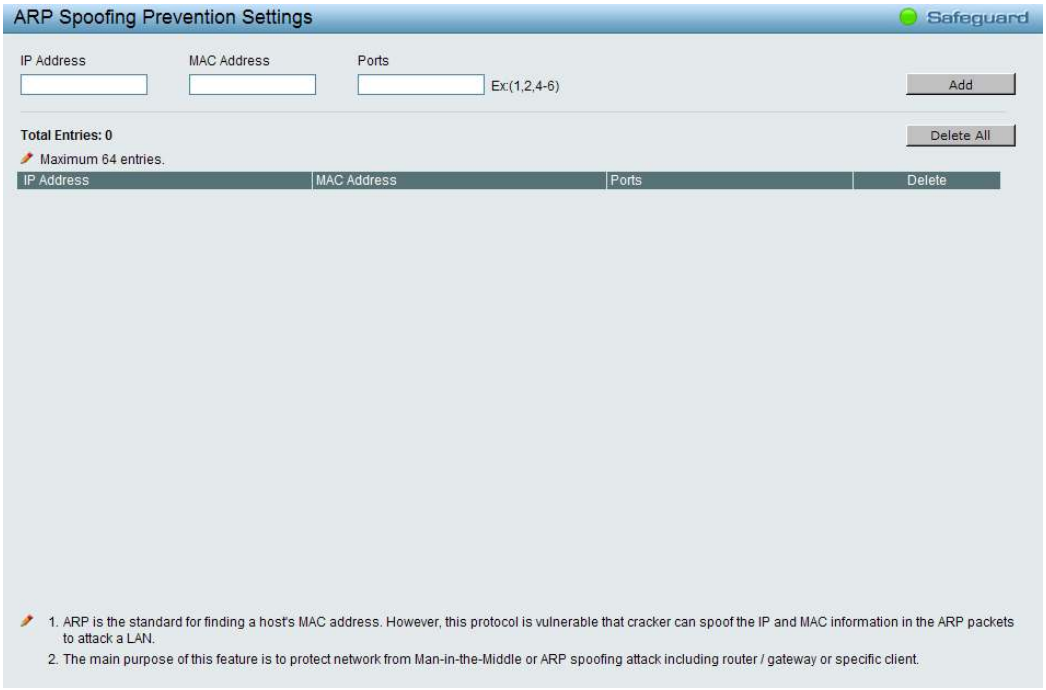

ARP Spoofing Prevention Settings
Safeguard
IP Address
MAC Address
Ports
Ex:(1,2,4-6)
Add
Total Entries: 0
Delete All
Maximum 64 entries.
IP Address
MAC Address
Ports
Delete
1. ARP is the standard for finding a host's MAC address. However, this protocol is vulnerable that cracker can spoof the IP and MAC information in the ARP packets to attack a LAN.
2. The main purpose of this feature is to protect network from Man-in-the-Middle or ARP spoofing attack including router / gateway or specific client.

Figure 5.86 – Security > ARP Spoofing Prevention Setting

Enter the **IP Address**, **MAC Address**, **Ports** and then click **Add** to create a checking/filtering rule. Click **Delete** to remove an existing rule and **Delete All** to clear all the entries.

Security > DHCP Server Screening

DHCP Server Screening function allows user to restrict the illegal DHCP server by discarding the DHCP service from distrusted ports. This page allows you to configure the DHCP Server Screening state for each port and designed trusted DHCP server IP address. Select **Ports** to be DHCP server trusted port and then click **Apply** to enable the function.

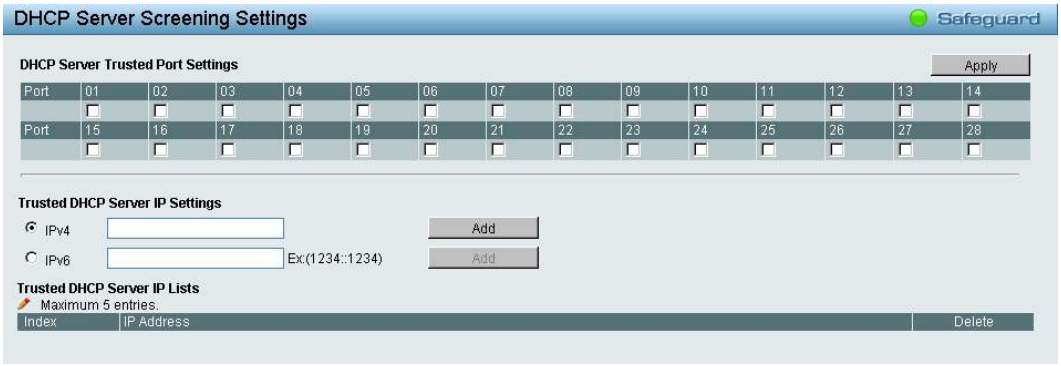


Figure 5.87 – Security > DHCP Server Screening

Trusted DHCP Server IP Settings:

To add the DHCP Trusted DHCP Server, set the following fields and click **Add**.

IPv4: Specifies the IPv4 address of the DHCP server to be trusted.

IPv6: Specifies the IPv6 address of the DHCP server to be trusted.

Click **Apply** for the settings to take effect.

Security > SSL

Secure Sockets Layer (SSL) is a security feature that provides a secure communication path between a Web Management host and the Switch Web UI by using authentication, digital signatures and encryption. These security functions are implemented by Ciphersuite, a security string that determines the cryptographic parameters, encryption algorithms and key sizes.

This page allows you to configure the SSL global state and the Ciphersuite settings. Select **Enable** or **Disable** and then click **Apply** to change the SSL state or the Ciphersuite settings of the Switch. By default, SSL is **Disabled** and all Ciphersuites are **Enabled**.

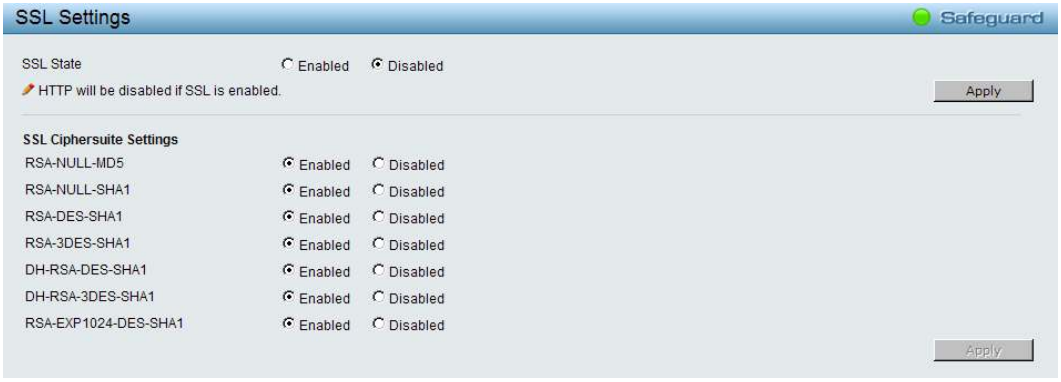


Figure 5.88 – Security > SSL Settings

NOTE: When SSL is enabled, it will take longer time to open a web page due to encryption. After saving configuration, please wait around 10 seconds for the system summery page.

Security > SSH > SSH Settings

SSH is an abbreviation of Secure Shell, which is a program allowing secure remote login and secure network services over an insecure network. It allows a secure login to remote host computers, a safe method of executing commands on a remote end node, and will provide secure encrypted and authenticated communication between two non-trusted hosts. SSH, with its array of unmatched security features is an essential tool in today's networking environment. It is a powerful guardian against numerous existing security hazards that now threaten network communications.

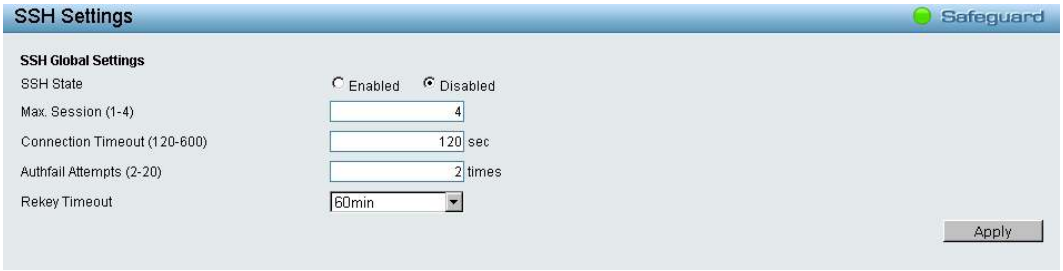


Figure 5.89 – Security > SSH > SSH Settings

To configure the SSH server on the Switch, modify the following parameters and click **Apply**:

SSH State: Enabled or Disabled SSH on the Switch. The default is *Disabled*.

Max Session (1 - 4): Enter a value between *1* and 4 to set the number of users that may simultaneously access the Switch. The default setting is 4.

Connection Timeout (120 - 600): Allows the user to set the connection timeout. The use may set a time between *120* and *600* seconds. The default setting is *120* seconds.

Authfail Attempts (2 - 20): Allows the Administrator to set the maximum number of attempts that a user may try to log on to the SSH Server utilizing the SSH authentication. After the maximum number of attempts has been exceeded, the Switch will be disconnected and the user must reconnect to the Switch to attempt another login. The number of maximum attempts may be set between *2* and *20*. The default setting is *2*.

Rekey Timeout: Using the pull-down menu uses this field to set the time period that the Switch will change the security shell encryptions. The available options are *Never*, *10 min*, *30 min*, and *60 min.* The default setting is *60 min.*

Security > SSH > SSH Authmode and Algorithm Settings

The SSH Authentication and Algorithm Settings page allows user to configure the desired types of SSH algorithms used for authentication encryption.

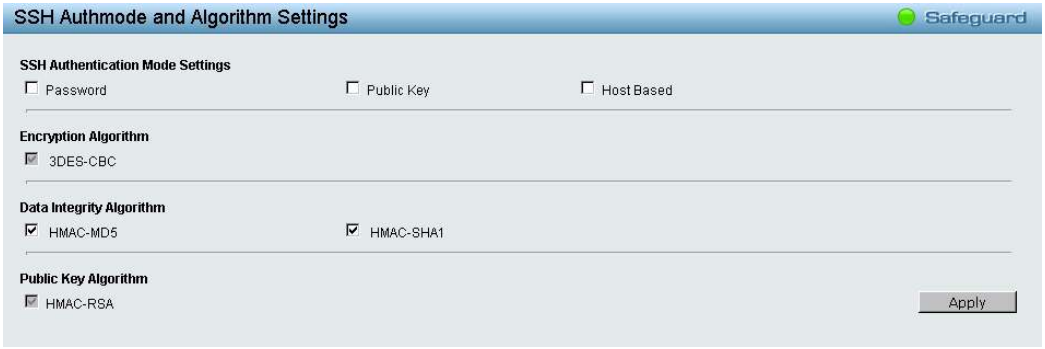


Figure 5.90 – Security > SSH > SSH Authmode and Algorithm Settings

SSH Authentication Mode Settings:

Password: Allows user to use a locally configured password for authentication on the Switch. When SSH status is enabled, the **Password** is enabled by default.

Public Key: This parameter may be enabled if the administrator wishes to use a public key configuration set on a SSH server, for authentication on the Switch. The default is disabled.

Host Based: This parameter may be enabled if the administrator wishes to use a host computer for authentication. This parameter is intended for Linux users requiring SSH authentication techniques and the host computer is running the Linux operating system with a SSH program previously installed. The default is disabled.

Encryption Algorithm:

DES-CBC: Use the check box to enable or disable the Data Encryption Standard encryption algorithm with Cipher Block Chaining. The default is enabled.

3DES-CBC: Use the check box to enable or disable the Triple Data Encryption Standard encryption algorithm with Cipher Block Chaining. The default is enabled.

Data Integrity Algorithm: When SSH status is enabled, the HMAC-MD5 and HMAC SHA1 are enabled by default.

HMAC-MD5: Use the check box to enable the supports of hash for message Authentication Code (HMAC) MD5 Message Digest (MD5) mechanism.

HMAC-SHA1: Use the check box to enable the supports of hash for message Authentication Code (HMAC) Secure Hash Algorithm (SHA) mechanism.

Public Key Algorithm:

HMAC-RSA: Use the check box to enable the supports of Hash for Message Authentication Code (HMAC) mechanism utilizing the RSA encryption algorithm. The default is disabled.

Click **Apply** to implement changes made.

Security > SSH > SSH User Authentication Lists

The SSH User Authentication Lists page is used to configure parameters for users attempting to access the Switch through SSH.

Figure 5.91 – Security > SSH > SSH User Authentication Lists

The user may view the following parameters:

User Name: A name of no more than *15* characters to identify the SSH user. This User Name must be a previously configured user account on the Switch.

Authentication Mode: The administrator may choose one of the following to set the authorization for users attempting to access the Switch.

Host Based – This parameter should be chosen if the administrator wishes to use a remote SSH server for authentication purposes.

Password – This parameter should be chosen if the administrator wishes to use an administrator-defined password for authentication. Upon entry of this parameter, the Switch will prompt the administrator for a password, and then to re-type the password for confirmation.

Public Key – This parameter should be chosen if the administrator wishes to use the public key on an SSH server for authentication.

Host Name: Enter an alphanumeric string of no more than *32* characters to identify the remote SSH user. This parameter is only used in conjunction with the *Host Based* choice in the Auth. Mode field.

Host IP: Enter the corresponding IP address of the SSH user. This parameter is only used in conjunction with the *Host Based* choice in the Auth. Mode field.

Security > Smart Binding > Smart Binding Settings

The primary purpose of Smart Binding is to restrict the access to a switch to a number of authorized users. Authorized clients can access a switch's port by either checking the pair of IP-MAC address with the pre-configured database or if DHCP snooping has been enabled in which case the switch will automatically learn the IP/MAC pairs by snooping DHCP packets and saving them to the Smart Binding white list. If an unauthorized client tries to access a Smart Binding enabled port, the system will block the access by dropping the packet. The IP network layer uses IPv4 address. The maximum number of IPv4 entries is 512 by ARP inspection and 128 by ARP+IP inspection.

Users can enable or disable the **Packet Inspection** and **DHCP Snooping** on the Switch.

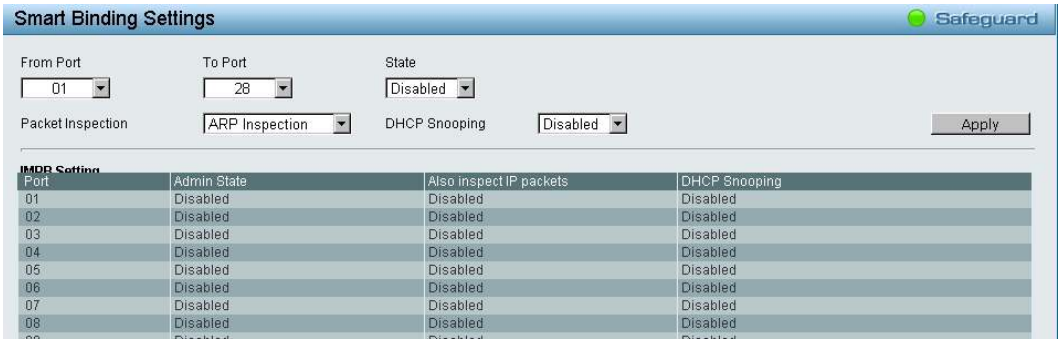


Figure 5.92 – Security > Smart Binding > Smart Binding Settings

The Smart Binding Settings page contains the following fields:

From Port/ To Port: Select a range of ports to set for Smart Binding.

State: Use the drop-down menu to enable or disable these ports for Smart Binding.

Enabled –Enable Smart Binding with related configurations to the ports

Disabled –Disable Smart Binding.

Packet Inspection: There are two options for IP packets inspection.

ARP Inspection: When the ARP inspection function is enabled, the legal ARP packets are forwarded, while the illegal packets are dropped.

ARP+IP Inspection: When the ARP+IP inspection function is enabled, all IP packets are checked. The legal IP packets are forwarded, while the illegal IP packets are dropped.

DHCP Snooping: By enable DHCP Snooping, the switch will snoop the packets sent from DHCP Server and clients, and update information to the White List.

Click **Apply** to make configurations make effects.

Security > Smart Binding > Smart Binding

The Smart Binding Settings page allows the user to create Static Smart Binding entries on the Switch.

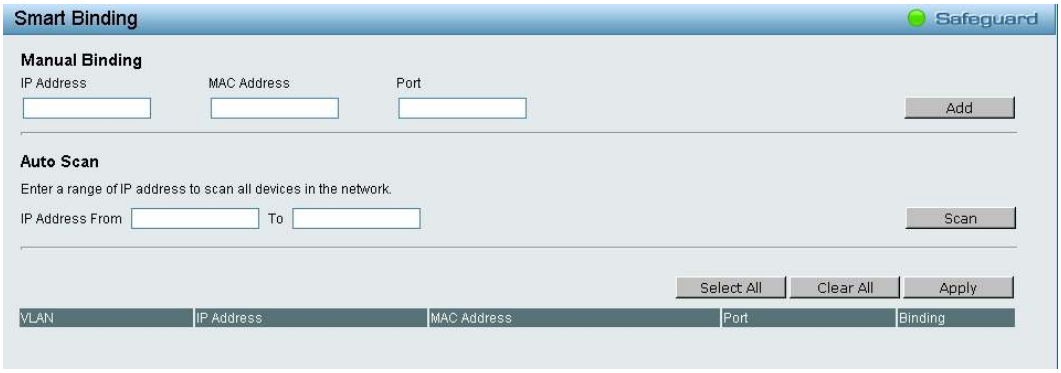


Figure 5.93 – Security > Smart Binding > Smart Binding

The Manual Binding Settings contains the following fields:

IP Address: Specifies the IP address to bind to the MAC address set below.

MAC Address: Specifies the MAC address to bind to the IP address set above.

Port: Specify the switch ports for which to configure this IP-MAC binding entry (IP Address + MAC Address).

Click **Add** to add a new entry.

Auto Scan: Specifies to scan connected devices in a range of IP address.

IP Address From/To: Specifies the range of IP Address to scan all devices in the network.

Click **Scan** and the search results will be listed in below table.

Binding: check the box to select desired binding devices.

Apply: click **Apply** to set Smart Binding entries.

Select All: to check the boxes of Binding for all found devices.

Clear All: to cancel the box of Binding.

Security > Smart Binding > White List

The White List displays the authorized clients set by Manual Binding Settings or Auto Scan Settings.

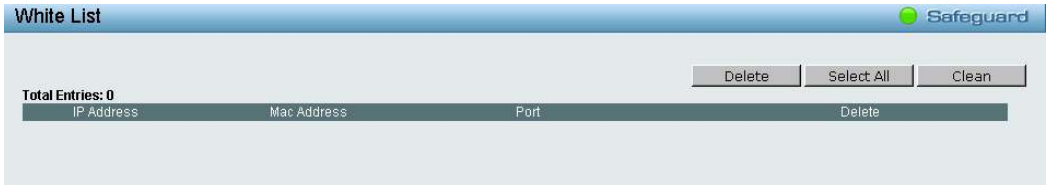


Figure 5.94 – Security > Smart Binding > White List

Select the check box of entry then click **Delete** to remove it.

Click **Select All** to select all entries of the table or click **Clean** to select none entries. Please keep at least one management host in the White List.

Security > Smart Binding > Black List

The Black List displays the unauthorized clients that have been blocked by the restrictions of Manual Binding Settings or Auto Scan Settings.

Figure 5.95 – Security > Smart Binding > Black List

By giving conditions, desired devices information can be screened out below then click **Find** to search for a list of the entry:

VID: Enter the VLAN ID number of the device.

IP Address: Enter the IP Address of the device.

MAC Address: Enter the MAC Address of the device.

Port: Enter the port number which the device connects.

Check a box of **Delete** column to release an entry from the forbidden list then click **Apply** to delete an entry from the list.

Click **Select All** to select all entries, or click **Clean** to select none of the entries.

AAA > RADIUS Server

The Authentication RADIUS server page allows user to facilitate centralized user administration as well as providing protection against a sniffing, active hacker.

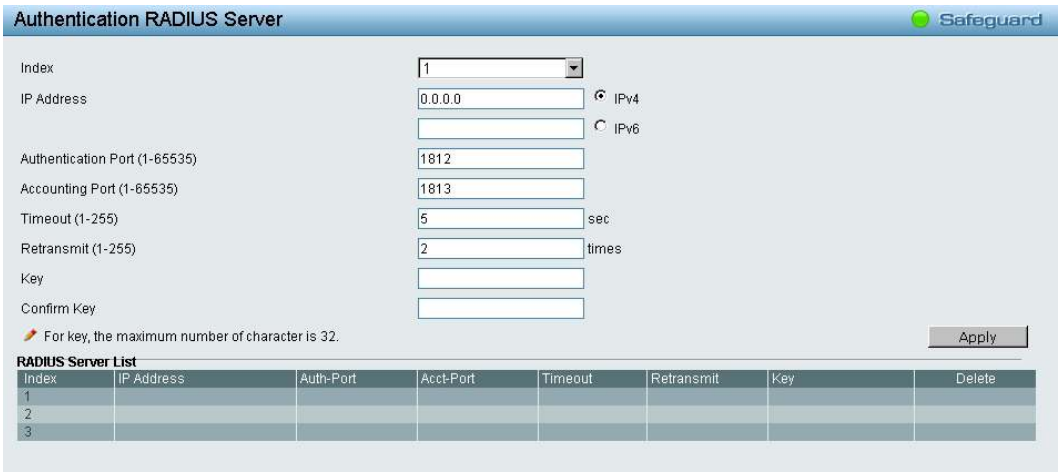


Figure 5.96 – AAA > RADIUS Server

Index: Choose the desired RADIUS server to configure: 1, 2 or 3.

IP Address: Select IPv4 or IPv6 and set the RADIUS server IP address.

Authentication Port (1 - 65535): Set the RADIUS authentic server(s) UDP port. The default port is 1812.

Accounting Port (1 - 65535): Set the RADIUS account server(s) UDP port. The default port is 1813.

Timeout (1 – 255 sec): This field will set the time the Switch will wait for a response of authentication from the user. The user may set a time between *1* and *255* seconds. The default setting is *5* seconds.

Retransmit (1 – 255 times): This command will configure the maximum number of times the Switch will accept authentication attempts. Users failing to be authenticated after the set amount of attempts will be denied access to the Switch and will be locked out of further authentication attempts. Command line interface users will have to wait 60 seconds before another authentication attempt. Telnet and web users will be disconnected from the Switch. The user may set the number of attempts from *1* to *255*. The default setting is *2*.

Key: Set the key the same as that of the RADIUS server.

Confirm Key: Confirm the shared key is the same as that of the RADIUS server.

Click **Apply** to implement configuration changes.

AAA > 802.1X > 802.1X Global Settings

Network switches provide easy and open access to resources, by simply attaching a client PC. Unfortunately this automatic configuration also allows unauthorized personnel to easily intrude and possibly gain access to sensitive data.

IEEE-802.1X provides a security standard for network access control, especially in Wi-Fi wireless networks. 802.1X holds a network port disconnected until authentication is completed. The switch uses Extensible Authentication Protocol over LANs (EAPOL) to exchange authentication protocol client identity (such as a user name) with the client, and forward it to another remote RADIUS authentication server to verify access rights. The EAP packet from the RADIUS server also contains the authentication method to be used. The client can reject the authentication method and request another, depending on the configuration of the client software and the RADIUS server. Depending on the authenticated results, the port is either made available to the user, or the user is denied access to the network.

Figure 5.97 – AAA > 802.1X > 802.1X Global Settings

NOTE: The Forward EAPOL PDU option will be useless if the Authentication State is Enabled.

AAA > 802.1X > 802.1X Port Settings

The 802.1X Port Settings page provide users to configure the 802.1X Port settings..

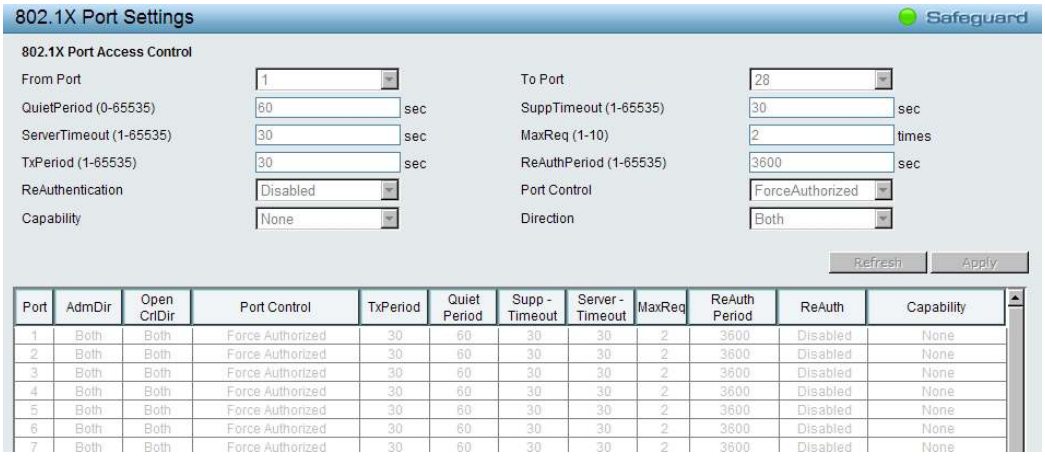


Figure 5.98 – AAA > 802.1X > 802.1X Port Settings

From Port/To Port: Enter the port or ports to be set.

QuietPeriod (0 – 65535): Sets the number of seconds that the switch remains in the quiet state following a failed authentication exchange with the client. Default is *60* seconds.

ServerTimeout (1 – 65535): Sets the amount of time the switch waits for a response from the client before resending the response to the authentication server. Default is *30* seconds.

TxPeriod (1 – 65535): This sets the TxPeriod of time for the authenticator PAE state machine. This value determines the period of an EAP Request/Identity packet transmitted to the client. Default is *30* seconds.

ReAuthentication: Determines whether regular reauthentication will take place on this port. The default setting is *Disabled*.

Capability: Indicates the capability of the 802.1X. The possible field values are:

Authenticator – Specify the Authenticator settings to be applied on a per-port basis.

None – Disable 802.1X functions on the port.

SuppTimeout (1 – 65535): This value determines timeout conditions in the exchanges between the Authenticator and the client. Default is *30* seconds.

MaxReq (1 – 10): This parameter specifies the maximum number of times that the switch retransmits an EAP request (md-5challnege) to the client before it times out the authentication session. Default is *2* times.

ReAuthPeriod (1 – 65535): A constant that defines a nonzero number of seconds between periodic reauthentication of the client. The default setting is *3600* seconds.

Port Control: This allows user to control the port authorization state.

Select **ForceAuthorized** to disable 802.1X and cause the port to transition to the authorized state without any authentication exchange required. This means the port transmits and receives normal traffic without 802.1X-based authentication of the client.

If **ForceUnauthorized** is selected, the port will remain in the unauthorized state, ignoring all attempts by the client to authenticate. The Switch cannot provide authentication services to the client through the interface.

If **Auto** is selected, it will enable 802.1X and cause the port to begin in the unauthorized state, allowing only EAPOL frames to be sent and received through the port. The authentication process begins when the link state of the port transitions from down to up, or when an EAPOL-start frame is received. The Switch then requests the identity of the client and begins relaying authentication messages between the client and the authentication server.

The default setting is *Auto***.**

Direction: Sets the administrative-controlled direction on the port. The possible field values are:

Both – Specify the control is exerted over both incoming and outgoing traffic through the controlled port selected in the first field.

In – Disables the support in the present firmware release.

Click **Apply** to implement configuration changes.

AAA > 802.1X > 802.1X User

The **802.1X User** page allows user to set different local users on the Switch. Enter **802.1X User** name, **Password** and **Confirm Password**. Properly configured local users will be displayed in the table. The numbers of local username is 100.

Figure 5.99 – AAA > 802.1X > 802.1X User

Click **Add** to add a new 802.1X user.

ACL > ACL Wizard

Access Control List (ACL) allows you to establish criteria to determine whether or not the Switch will forward packets based on the information contained in each packet's header. This criteria can be specified on a basis of the MAC address, or IP address.

The ACL Configuration Wizard will aid with the creation of access profiles and ACL Rules. The ACL Wizard will create the access rule and profile automatically. For DGS-1500-20/28, the maximum usable profiles are 50 and with 200 Rules in total for the switch. For DGS-1500-52, the maximum usable profiles are 50 and with 450 Rules in total for the switch.

Figure 5.100 – ACL > ACL Wizard

From: Specify the origin of accessible packets. The possible values are:

Any - Indicates ACL action will be on packets from any source.

MAC Address - Indicates ACL action will be on packets from this MAC address. If you want to enter a Wildcard for all MACs (00-00-00-00-00-00), you need to leave the field blank.

IPv4 Address - Indicates ACL action will be on packets from this IPv4 source address.

IPv6 Address - Indicates ACL action will be on packets from this IPv6 source address.

To: Specify the destination of accessible packets. The possible values are:

Any - Indicates ACL action will be on packets from any source.

MAC Address - Indicates ACL action will be on packets from this MAC address. The field of format is xx-xx-xx-xx-xx-xx. If you want to enter a Wildcard for all MACs (00-00-00-00-00-00), you need to leave the field blank.

IPv4 Address - Indicates ACL action will be on packets from this IPv4 source address.

IPv6 Address - Indicates ACL action will be on packets from this IPv6 source address.

Service Type: Specify the type of service. The possible values are:

Any - Indicates ACL action will be on packets from any service type.

Ether type - Specifies an Ethernet type for filtering packets.

ICMP All - Indicates ACL action will be on packets from ICMP packets.

IGMP - IGMP packets can be filtered by IGMP message type.

TCP All - Indicates ACL action will be on packets from TCP Packets.

TCP Source Port - Matches the packet to the TCP Source Port.

TCP Destination Port - Matches the packet to the TCP Destination Port.

UDP All - Indicates ACL action will be on packets from UDP Packets.

UDP Source Port - Matches the packet to the UDP Source Port.

UDP Destination Port - Matches the packet to the UDP Destination Port.

Action: Specify the ACL forwarding action matching the rule criteria. *Permit* forwards packets if all other ACL criteria are met. *Deny* drops packets if all other ACL criteria is met.

Ports: Enter a range of ports to be configured.

Press **Apply** for the settings to take effect.

NOTE: Once the ACL rules conflict, rules with the smaller rule ID will take higher priority.

NOTE: Be careful when configuring ACL rules, an inappropriate ACL rule may cause management access failure.

ACL > Access Profile List

The Access Profile List provides information for configuring ACL Profiles manually. ACL profiles are attached to interfaces, and define how packets are forwarded if they match the ACL criteria.

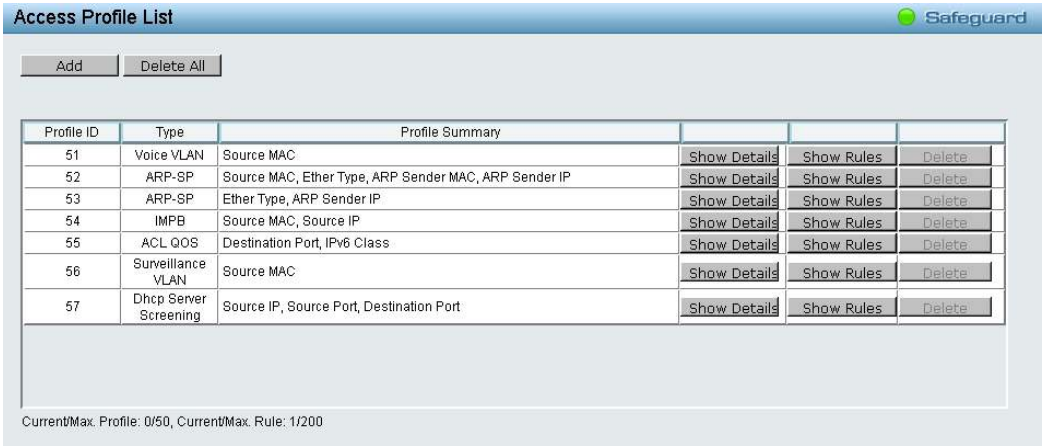

Access Profile List
Safeguard
Add
Delete All
Profile ID
Type
Profile Summary
51 Voice VLAN Source MAC Show Details Show Rules Delete
52 ARP-SP Source MAC, Ether Type, ARP Sender MAC, ARP Sender IP Show Details Show Rules Delete
53 ARP-SP Ether Type, ARP Sender IP Show Details Show Rules Delete
54 IMPB Source MAC, Source IP Show Details Show Rules Delete
55 ACL QOS Destination Port, IPv6 Class Show Details Show Rules Delete
56 Surveillance VLAN Source MAC Show Details Show Rules Delete
57 Dhcp Server Screening Source IP, Source Port, Destination Port Show Details Show Rules Delete
Current/Max. Profile: 0/50, Current/Max. Rule: 1/200

Figure 5.101 – ACL > Access Profile List

The contents of Access Profile List table include:

Profile ID: Indicates the profile Identification number. The possible configured profile IDs are 1~50, and profile ID 51~57 are reserved for the pre-defined features.

Type: The owner type of ACL profile.

Profile Summary: Displays the profile summary.

Show Details: To display an ACL's profile details. The ACL profile details are displayed below the ACL table.

Show Rules: To show the access rule in this profile.

Delete: To delete an access profile.

Click **Add** to manually add a profile:

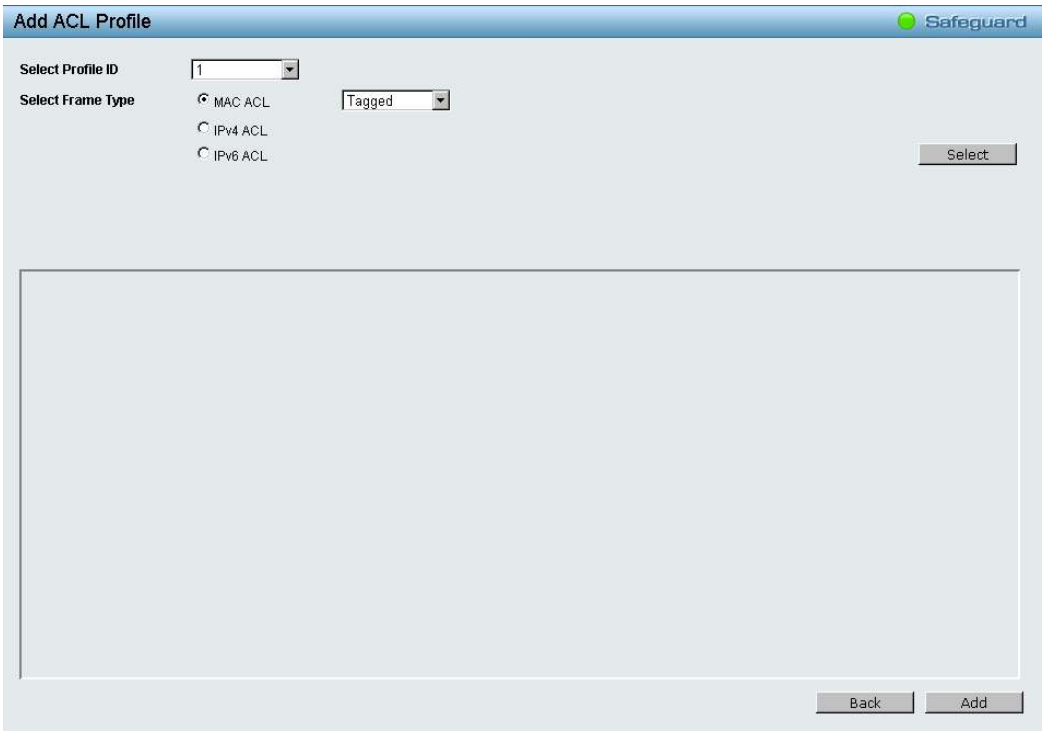


Figure 5.102 – Add Access Profile

The steps of adding an access profile are described below:

1) After selecting the **Profile ID** and **Frame Type** (MAC, IPv4 or IPv6), specify attributes like Untagged/Tagged (for MAC), ICMP/IGMP/TCP/UDP (for IPv4), or ICMP/TCP/UDP (for IPv6). Click **Select** and a simplified frame diagram will be displayed.

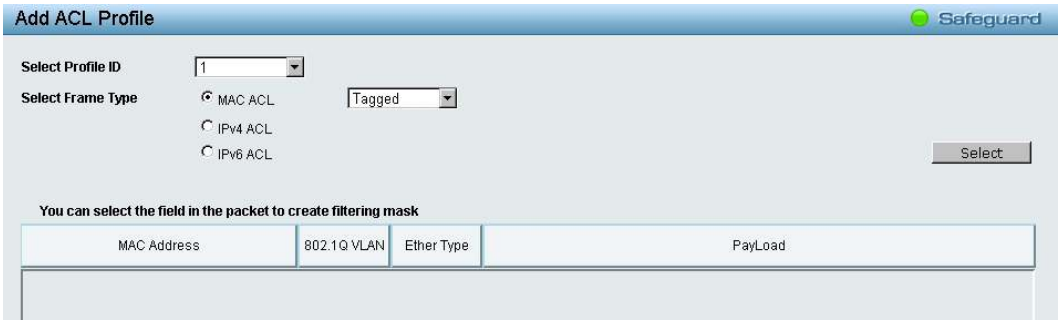


Figure 5.103 – Add Access Profile

The Add ACL Profile Page contains the following fields:

Parameter	Description
Profile ID	Select an unique identifier number for this profile set. This value is from 2 to 50.
Frame Type	Select frame type based on MAC address, IPv4 address, IPv6 address or packet content. This will change the window according to the requirements for the type of profile. Select MAC ACL to instruct the Switch to examine the layer 2 part of each packet header. Select IPv4 ACL to instruct the Switch to examine the IPv4 address in each frame's header. Select IPv6 ACL to instruct the Switch to examine the IPv6 address in each frame's header. Select Packet Content to instruct the Switch to examine the packet content in each frame's header.
MAC ACL	Defines the ACL profile Layer 2 protocols. The possible values are: **Tagged -** Defines the profile Layer 2 to match 802.1Q fields in the Layer 2 header. **Untagged -** Defines the profile Layer 2 to check the Layer 2 header without the 802.1Q fields.
IPv4 ACL	Defines the IPv4 ACL profile protocols. The possible fields are: **ICMP -** Specifies ICMP as the Layer 4 protocol that the access profile checks. **IGMP -** Specifies IGMP as the Layer 4 protocol that the access profile checks. **TCP -** Specifies TCP as the Layer 4 protocol that the access profile checks. **UDP -** Specifies UDP as the Layer 4 protocol that the access profile checks.
IPv6 ACL	Defines the IPv6 ACL profile protocols. The possible fields are: **ICMP —** Specifies ICMP as the Layer 3 IPv6 protocol that the access profile checks. **TCP —** Specifies TCP as the Layer 3 IPv6 protocol that the access profile checks. **UDP —** Specifies UDP as the Layer 3 IPv6 protocol that the access profile checks.

To define the MAC ACL profile: Select **MAC ACL** with Tagged and click **Select** button. The updates to show the follows:

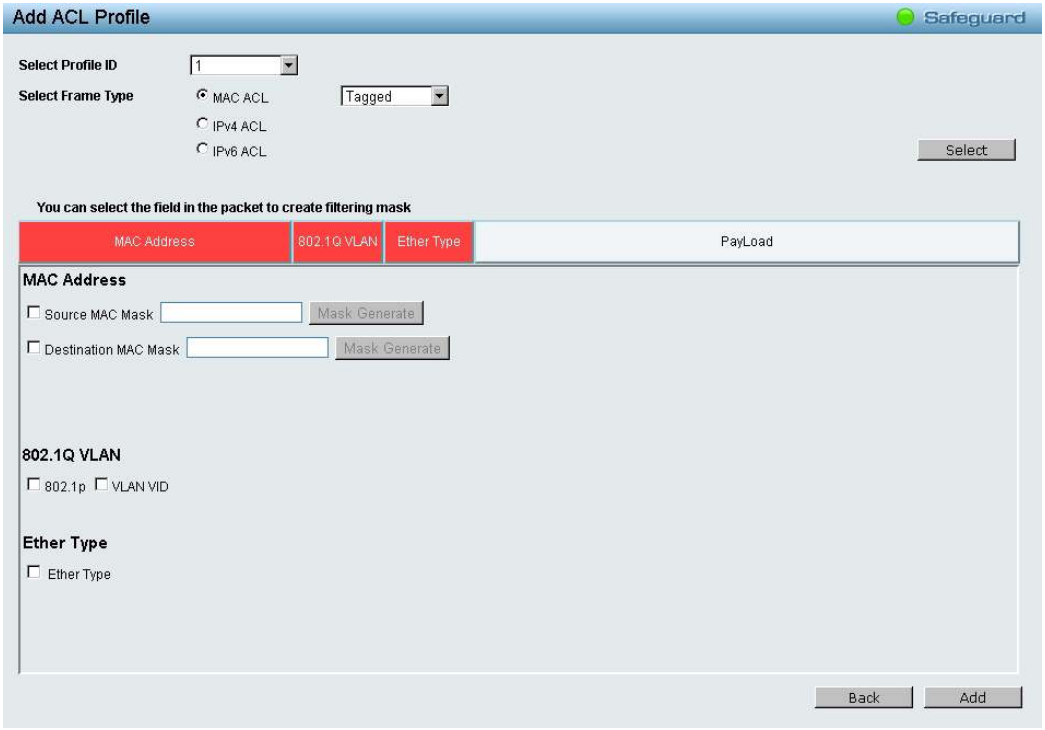


Figure 5.105 – Add Access Profile (MAC ACL)

The Add ACL Profile MAC ACL contains the following fields:

Field	Description
Source MAC Mask	Enter a MAC address mask for the source MAC address, e.g. FF-FF-FF-FF-FF-FF.
Destination MAC Mask	Enter a MAC address mask for the destination MAC address, e.g. FF-FF-FF-FF-FF-FF.
802.1p	Selecting this option instructs the Switch to examine the 802.1Q VLAN identifier of each packet header and use this as the full or partial criterion for forwarding.
VLAN ID	Selecting this option instructs the Switch to examine the 802.1p priority value of each packet header and use this as the, or part of the criterion for forwarding.
Ether Type	Selecting this option instructs the Switch to examine the Ethernet type value in each frame's header.

Click **Add** button then the ACL profile is added.

To define the IPv4 ACL ICMP profile: Select **IPv4 ACL** with **ICMP** and click **Select** button. The updates to show the follows:

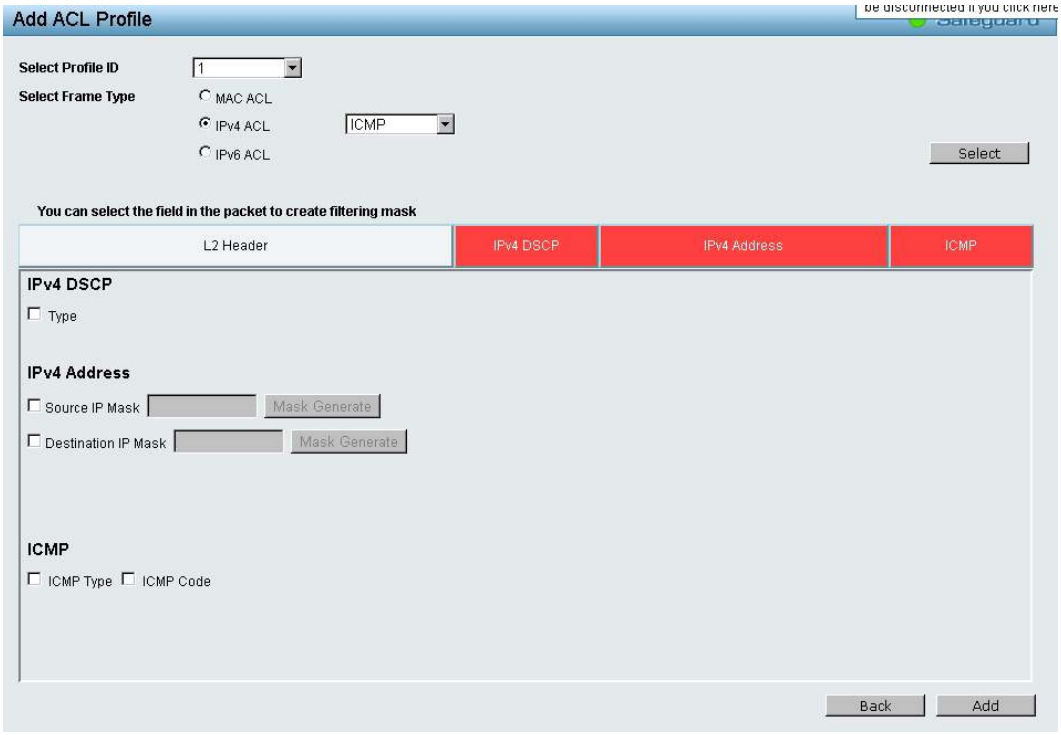


Figure 5.106 – Add Access Profile (IPv4 ACL ICMP)

The Add ACL Profile IPv4 ACL ICMP address page contains the following fields:

Field	Description
Source IP Mask	Defines the range of source IP addresses, relevant to the ACL rules. (0=ignore, 1=check). For example, to set 176.212.XX.XX, use mask 255.255.0.0
Destination IP Mask	Defines the range of destination IP addresses, relevant to the ACL rules. (0=ignore, 1=check). For example, to set 176.212.XX.XX, use mask 255.255.0.0
ICMP Type	Sets the ICMP Type field as an essential field to match.
ICMP Code	Sets the ICMP code field as an essential field to match.

Click **Add** button then the ACL profile is added.

To define the IPv4 ACL IGMP profile: Select **IPv4 ACL** with **IGMP** and click **Select** button. The updates to show the follows:

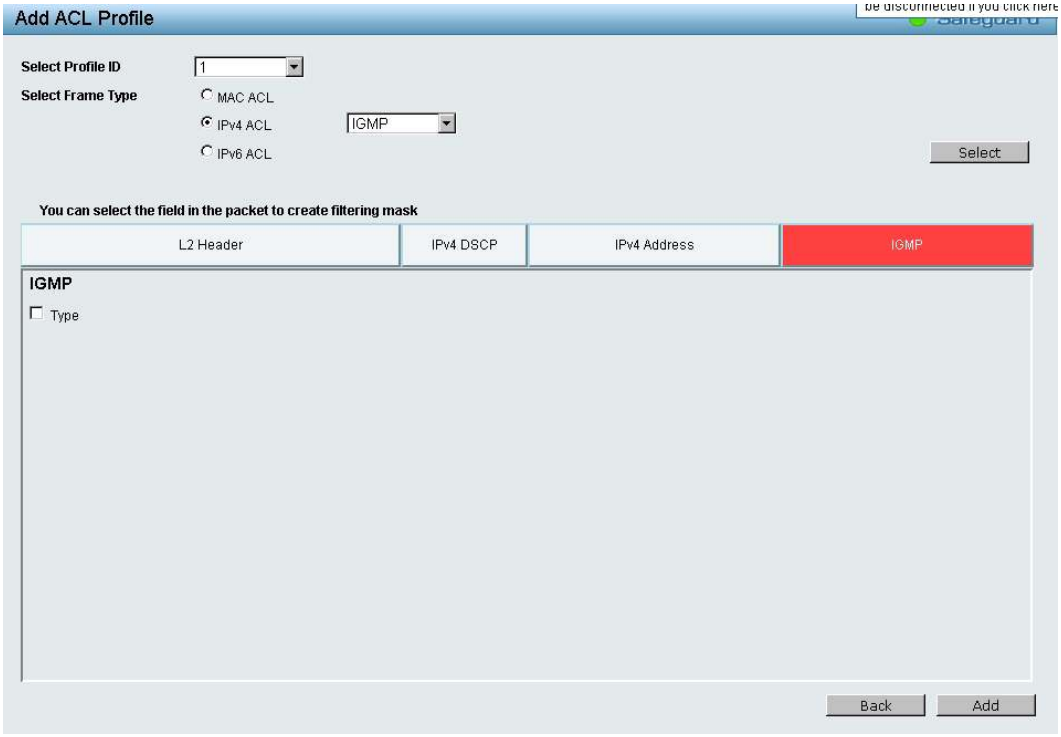


Figure 5.107 – Add Access Profile (IPv4 ACL IGMP)

Click **Add** button then the ACL profile is added.

To define the IPv4 ACL TCP profile: Select **IPv4 ACL** with **TCP** and click **Select** button. The updates to show the follows:

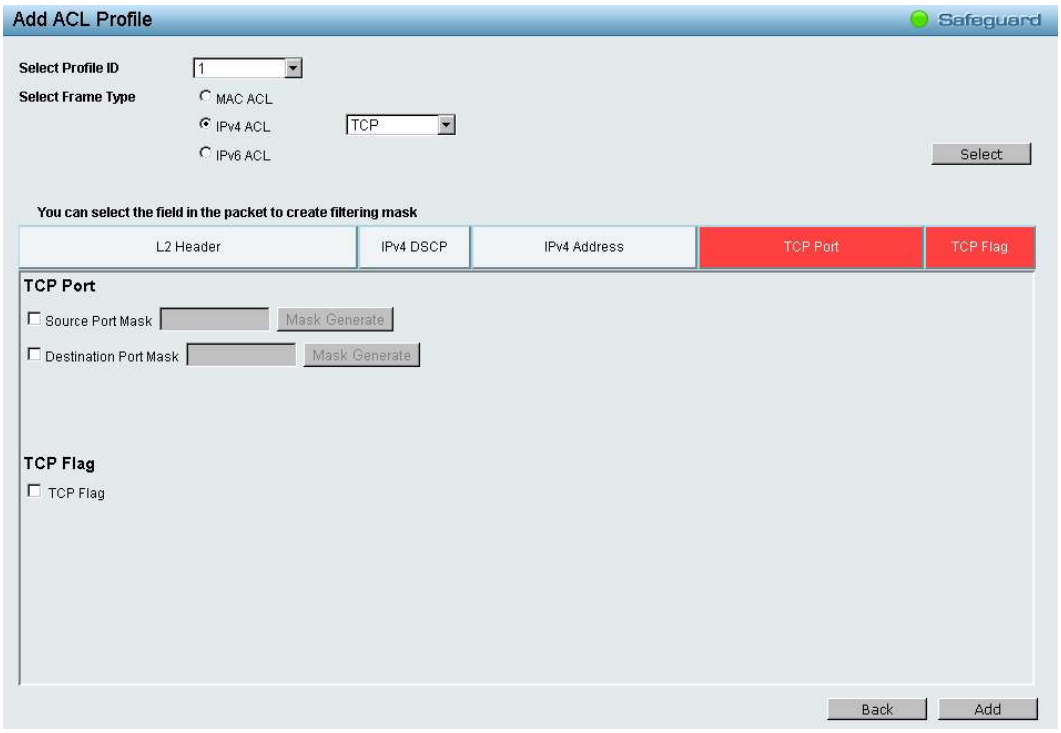


Figure 5.107 – Add Access Profile (IPv4 ACL TCP)

The Add ACL Profile IPv4 ACL TCP port page contains the following fields:

Field	Description
Source Port Mask	Defines the range of source Ports relevant to the ACL rules. (0=ignore, 1=check). For example, to set 0 – 15, set mask of FFF0.
Destination Port Mask	Defines the range of destination IP addresses, relevant to the ACL rules. (0=ignore, 1=check). For example, to set 0 – 15, set mask of FFF0.
TCP Flag	Sets the TCP Flag Type field as an essential field to match.

Click **Add** button then the ACL profile is added.

To define the IPv4 ACL UDP profile: Select **IPv4 ACL** with **UDP** and click **Select** button. The updates to show the follows:

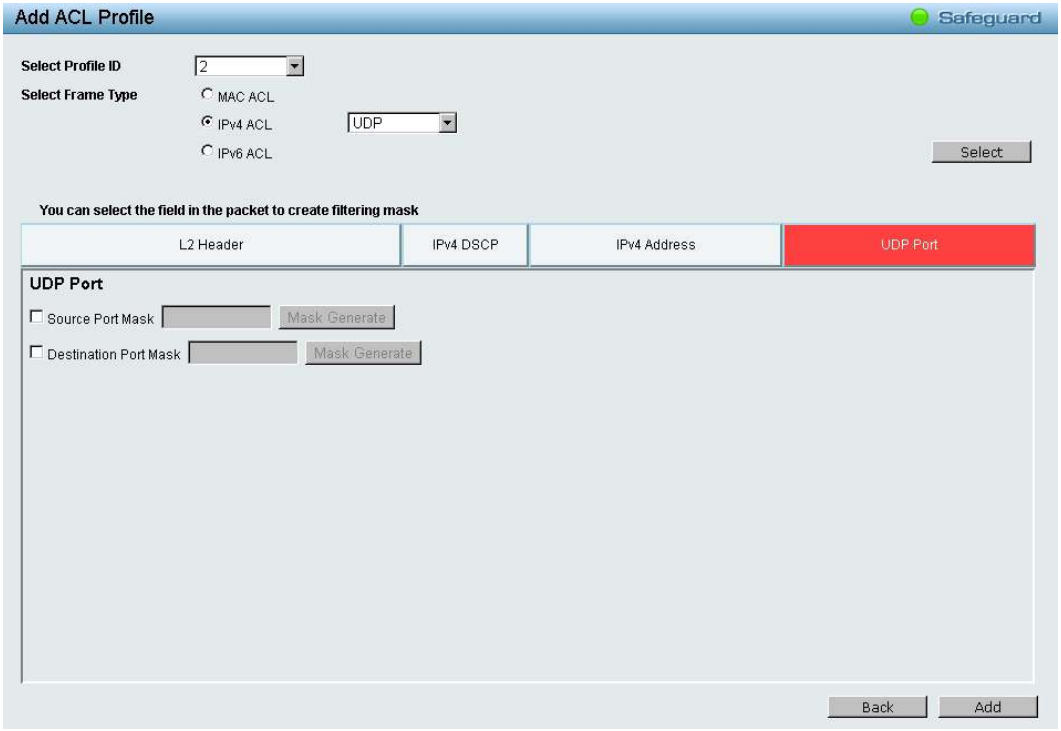


Figure 5.108 – Add Access Profile (IPv4 ACL UDP)

The Add ACL Profile IPv4 ACL UDP port page contains the following fields:

Field	Description
Source Port Mask	Defines the range of source Ports relevant to the ACL rules. (0=ignore, 1=check). For example, to set 0 – 15, set mask of F.
Destination Port Mask	Defines the range of destination IP addresses, relevant to the ACL rules. (0=ignore, 1=check). For example, to set 0 – 15, set mask of F.

Click **Add** button then the ACL profile is added.

NOTE: A combination of one or several filtering masks can be selected simultaneously. The page updates with the relevant field(s).

To define the IPv6 ACL ICMP profile: Select **IPv6 ACL** with **ICMP** and click **Select** button. The updates to show the follows:

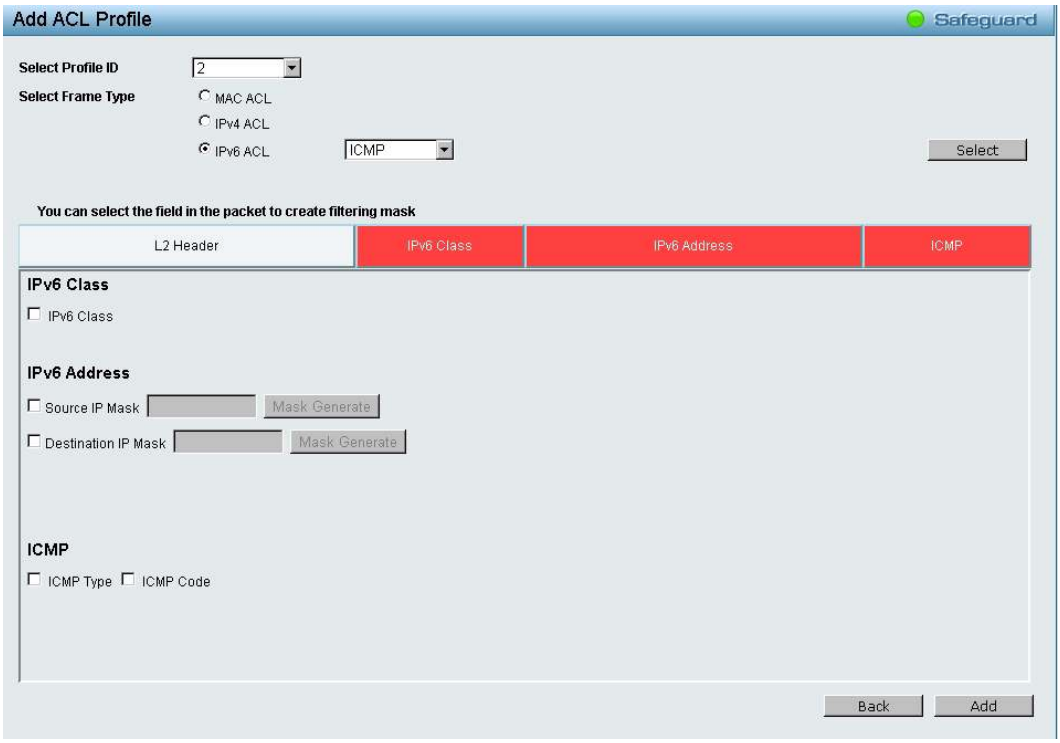


Figure 5.109 – Add Access Profile (IPv6 ACL ICMP)

The Add ACL Profile IPv6 ACL ICMP address page contains the following fields:

Field	Description
Source IP Prefix	Defines the range of source IP addresses, relevant to the ACL rules. (0=ignore, 1=check). For example, to set 2002:0:0:0:0:0:b0d4:0, use mask 128
Destination IP Prefix	Defines the range of destination IP addresses, relevant to the ACL rules. (0=ignore, 1=check). For example, to set 2002:0:0:0:0:0:bfd4:0, use mask 128
ICMP Type	Sets the ICMP Type field as an essential field to match.
ICMP Code	Sets the ICMP code field as an essential field to match.

Click **Add** button then the ACL profile is added.

To define the IPv6 ACL TCP profile: Select **IPv6 ACL** with **TCP** and click **Select** button. The updates to show the follows:

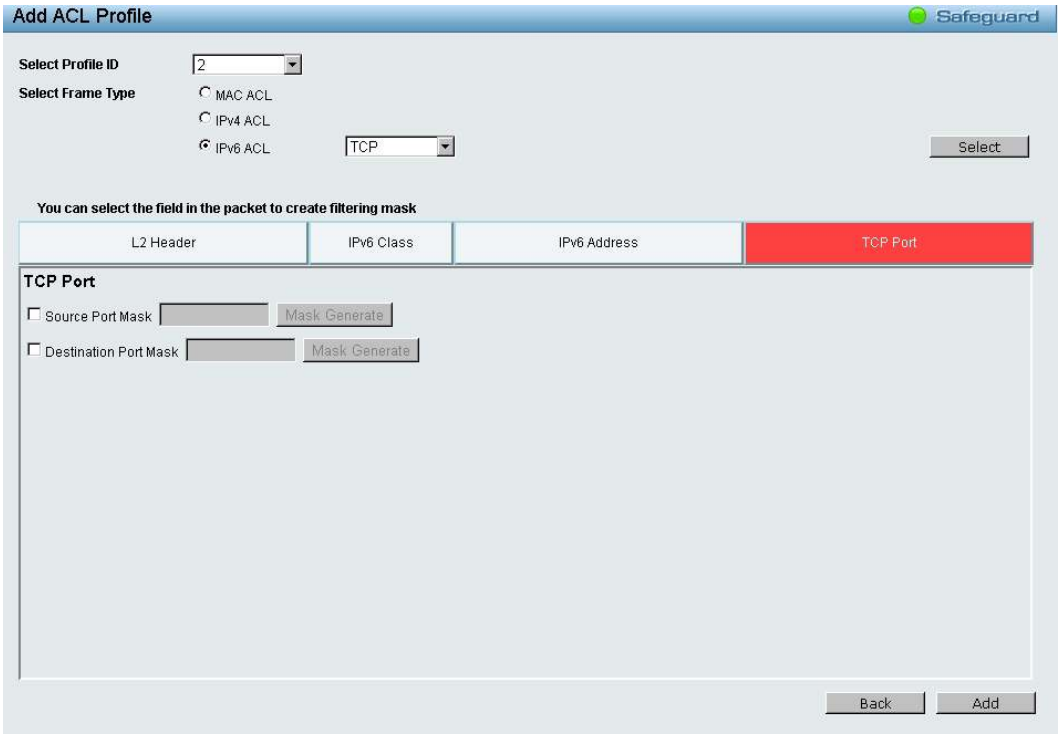


Figure 5.110 – Add Access Profile (IPv6 ACL TCP)

The Add ACL Profile IPv6 ACL TCP port page contains the following fields:

Field	Description
Source Port Mask	Defines the range of source Ports relevant to the ACL rules. (0=ignore, 1=check). For example, to set 0 – 15, set mask of FFF0.
Destination Port Mask	Defines the range of destination IP addresses, relevant to the ACL rules. (0=ignore, 1=check). For example, to set 0 – 15, set mask of FFF0.

Click **Add** button then the ACL profile is added.

To define the IPv6 ACL UDP profile: Select **IPv6 ACL** with **UDP** and click **Select** button. The updates to show the follows:

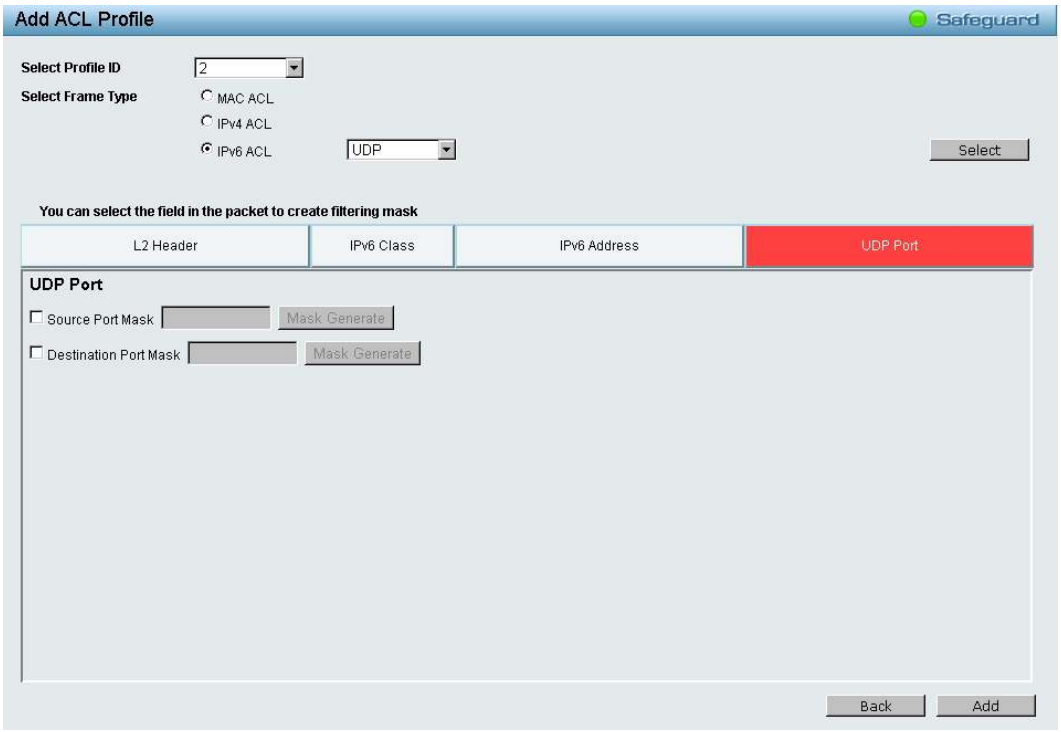


Figure 5.111 – Add Access Profile (IPv6 ACL UDP)

The Add ACL Profile IPv6 ACL UDP port page contains the following fields:

Field	Description
Source Port Mask	Defines the range of source Ports relevant to the ACL rules. (0=ignore, 1=check). For example, to set 0 – 15, set mask of F.
Destination Port Mask	Defines the range of destination IP addresses, relevant to the ACL rules. (0=ignore, 1=check). For example, to set 0 – 15, set mask of F.

Click **Add** button then the ACL profile is added.

NOTE: A combination of one or several filtering masks can be selected simultaneously. The page updates with the relevant field(s).

2) Selecting the field of interest will display the related columns in the lower part of the page. Enter the filtering mask and click **Apply** when done. A filtering mask is to specify the digit that you want to check. For example, if you want to check a network of 192.168.1.0/24, then you should enter the IP mask as 255.255.255.0.

Figure 5.112 – Access Rule List

NOTE: You cannot select Payload in a MAC ACL, or L2 Header in IP ACL.

3) After the **Profile ID** has been created, click **Continue** to go back to the main Access Profile List page, clicking the **Edit / New Rules** button to enter the **Access Rule List** page.

Figure 5.113 – Access Rule List

Profile ID: Indicates the corresponding access profile Identification number.

Access ID: Indicates the access rule Identification number.

Profile Type: Displays the profile type.

Summary: Displays the access rule summary.

Action: Displays the access rule action.

To add a new rule, click **Add**:

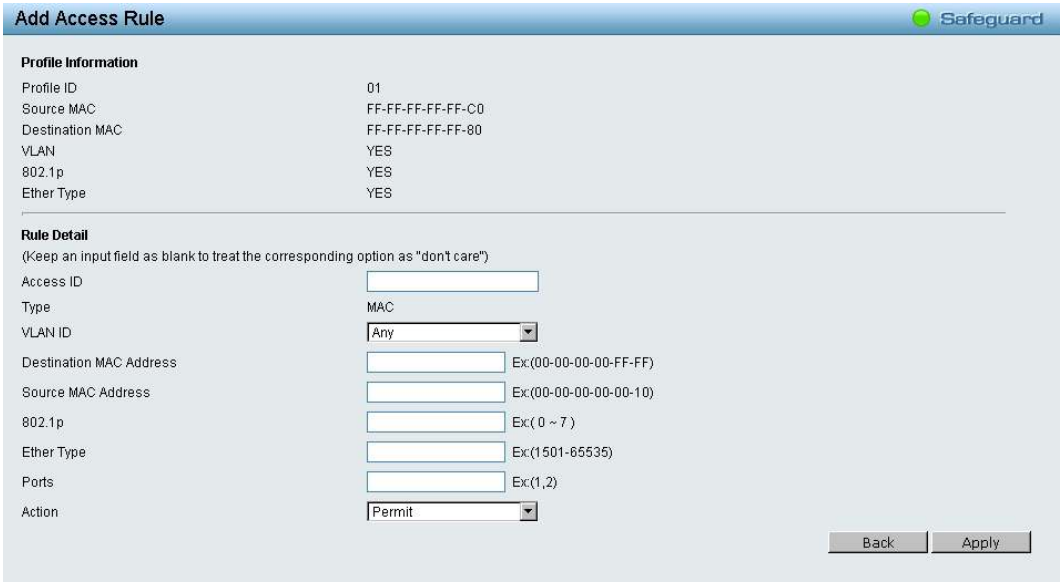


Figure 5.114 – Add Access Rule

Profile Information displays the information to which the rule is being added to, including **Profile ID** and **Ether Type**.

In **Rule Detail**, you can specify the details of an access rule. Below are all the possible parameters that can be set.

Access ID: Specify the Access ID (1-65535).

Type: Display the type of rule.

VLAN ID: Specify the VLAN ID.

Destination MAC Address: Specify the destination MAC address.

Source MAC Address: Specify the source MAC address.

802.1p: Specify the 802.1p. The possible value is from 0 to 7.

Ether Type: Specify the Ether Type. The field range is from 1501 to 65535.

Ports: Specify the switch ports that you want to implement the access rule to.

Action: Specify the ACL forwarding action matching the rule criteria. **Permit** forwards packets if all other ACL criteria are met. **Deny** drops packets if all other ACL criteria is met.

Click **Apply** to make it effective.

NOTE: The switch begins the access rule with the smallest access ID, so be careful in assigning the ID for the expected results.

To modify an existing rule, please click on the Access ID hyperlink.

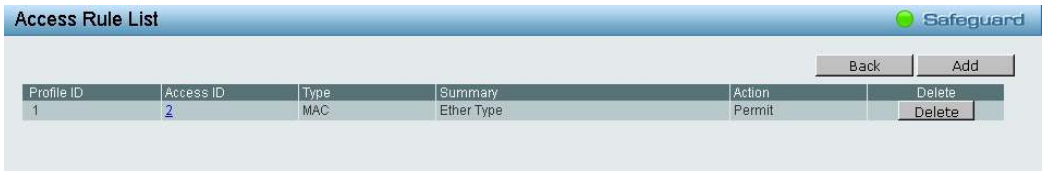


Figure 5.115 – ACL > Access Profile List > Access Rule List

ACL > ACL Finder

This page is used to help find a previously configured ACL entry. To search for an entry, enter the profile ID from the drop-down menu, select a port that you wish to view, define the state and click **Search.** The table on the lower half of the screen will display the entries. To delete an entry click the corresponding **Delete** button.

Figure 5.116 – ACL > ACL Finder

PoE > PoE Global Settings (DGS-1500-28P only)

This page allows user to configure the global PoE settings of the device and also displays current PoE status including RPS Status, Total PoE Power Budget, Power Used, Power Left and The percentage of system power supplied.

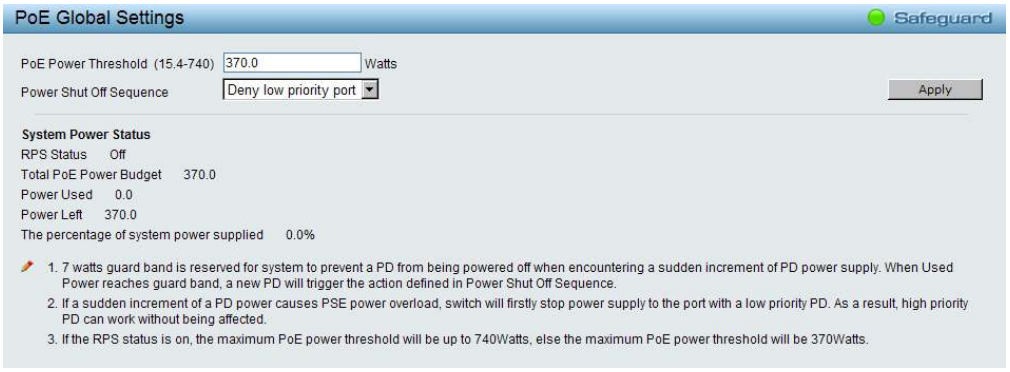

PoE Global Settings
Safeguard
PoE Power Threshold (15.4-740)
370.0
Watts
Power Shut Off Sequence
Deny low priority port
Apply
System Power Status
RPS Status Off
Total PoE Power Budget 370.0
Power Used 0.0
Power Left 370.0
The percentage of system power supplied 0.0%
1. 7 watts guard band is reserved for system to prevent a PD from being powered off when encountering a sudden increment of PD power supply. When Used Power reaches guard band, a new PD will trigger the action defined in Power Shut Off Sequence.
2. If a sudden increment of a PD power causes PSE power overload, switch will firstly stop power supply to the port with a low priority PD. As a result, high priority PD can work without being affected.
3. If the RPS status is on, the maximum PoE power threshold will be up to 740Watts, else the maximum PoE power threshold will be 370Watts.

Figure 5.117 – PoE > PoE Global Settings

PoE Power Threshold: To configure the maximum power for PoE function. The maximum PoE is from 15.4 to 740 Watts.

Power Shut Off Sequence: Defines the method used to deny power to a port once the threshold is reached. The possible fields are:

Deny next port: When the power budget is exceeded, the next port attempting to power up is denied, regardless of the port priority.

Deny low priority port: The port with the lower priority will be shut down to allow the higher priority port to power up.

Click **Apply** to make the configurations take effects.

System Power Status: Displays the system power status of device.

RPS Status: Displays the RPS status is on or off.

Total PoE Power Budget: Displays the total PoE power budget of this switch.

Power Used: Displays the current used power of the switch.

Power Left: Displays the left power of the switch.

The percentage of system power supplied: Displays the percentage of system power supplied of the switch.

PoE > PoE Port Settings (DGS-1500-28P only)

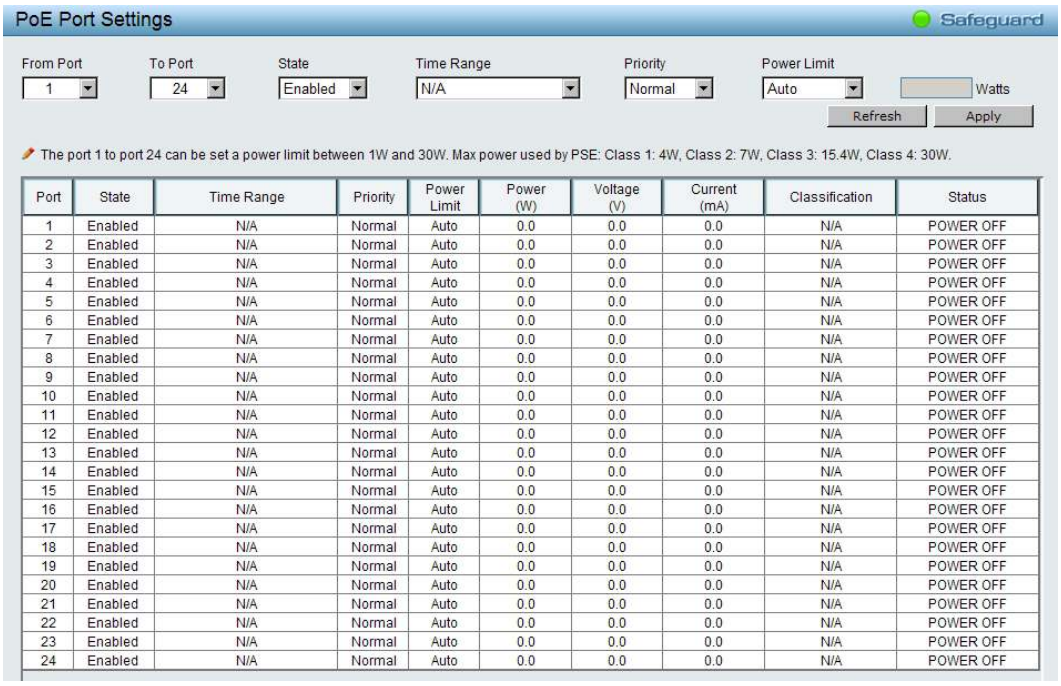
DGS-1500-28P supports Power over Ethernet (PoE) as defined by the IEEE specification. It supplies power to PD device up to 15.4W for all ports or 30W for port 1~24, meeting IEEE802.3af standards and pre-802.3at standards.

IEEE 802.3at defined that the PSE provides power according to the following classification:

Class	Usage	Output power limit by PSE
0	Default	15.4W
1	Optional	4.0W
2	Optional	7.0W
3	Optional	15.4W
4	Optional	30W

The PoE port table will display the PoE status including, Port State, Time Range, Priority, Power Limit, Power (W), Voltage (V), Current (mA), Classification, Port Status. The device will auto disable the ports if port current is over 375mA in 802.3af mode or 625mA in pre-802.3at mode.

Note: The PoE Status information of Power current, Power Voltage, and Current is the power usage information of the connected PD; please "Refresh" to renew the information.



Port	State	Time Range	Priority	Power Limit	Power (W)	Voltage (V)	Current (mA)	Classification	Status
1	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
2	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
3	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
4	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
5	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
6	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
7	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
8	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
9	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
10	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
11	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
12	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
13	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
14	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
15	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
16	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
17	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
18	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
19	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
20	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
21	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
22	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
23	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF
24	Enabled	N/A	Normal	Auto	0.0	0.0	0.0	N/A	POWER OFF

Figure 5.118 – PoE > PoE Port Settings

From Port / To Port: Specifies the PoE function of a port or ports.

State: Indicates if PoE is enabled on the interface. The possible field values are:

Enabled: PoE is enabled on the ports.

Disabled: PoE is disabled on the ports.

Time Range: Specifies the time-based PoE function on designated port(s). Default setting is **N/A**.

Priority: Configure the power supply priority as “Low”, “Normal”, or “High” on designated port(s). Default is **Normal**.

Power Limit: This function allows user to manually set the port power current limitation to be given to the PD. To protect the device and the connected devices, the power limit function will disable the PoE function of the port when the power is overloaded. Select from "**Class 1**", "**Class 2**", "**Class 3**", **“Class 4”** and "**Auto**" for the power limit. "**Auto**" will negotiate and follow the classification from the PD power current based on the 802.3at standard. If select “**User Define”**, user can input the power budget (from 1 to 30W) to manually assign an upper limit of port power budget on designated port(s).

Click **Refresh** to refresh the table information or click **Apply** to make the configurations take effects.

Note: For the PoE Port Settings table, if the classification was shown as “Legacy PD”, it will be classified to non-AF PD or Legacy PD.

SNMP > Trap to SmartConsole

The Trap to SmartConsole page allows user the set the difference status of SNMP notifications trapped to the Smartconsole.

Figure 5.119 – SNMP > Trap to SmartConsole

Destination IP: Specifies the destination IP.

Illegal Login: Specifies the device to send illegal login notifications.

Device Bootup: Specifies the device to send bootup notifications.

Port Link Up/Link Down: Specifies the device to send notifications when port linkup or link down.

RSTP Port State Change: Specifies the device to send notifications when RSTP port state changes.

Firmware Upgrade State: Specifies the device to send notifications when firmware upgrades.

Duplicate IP Detected: Specifies the device to send notifications when duplicate IP were detected.

SNMP > SNMP > SNMP Global Settings

Simple Network Management Protocol (SNMP) is an OSI Layer 7 (Application Layer) protocol designed specifically for managing and monitoring network devices. SNMP enables network management stations to read and modify the settings of gateways, routers, switches, and other network devices. Use SNMP to configure system features for proper operation, monitor performance and detect potential problems in the Switch or LAN.

Managed devices that support SNMP include software (referred to as an agent), which runs locally on the device. A defined set of variables (managed objects) is maintained by the SNMP agent and used to manage the device. These objects are defined in a Management Information Base (MIB), which provides a standard

presentation of the information controlled by the on-board SNMP agent. SNMP defines both the format of the MIB specifications and the protocol used to access this information over the network.

The default SNMP global state is disabled. Select Enable and select Trap Settings then click **Apply** to enable the SNMP function.

Figure 5.120 – SNMP > SNMP > SNMP Global Settings

Trap Settings: Specifies whether the device can send SNMP notifications.

SNMP Authentication Traps: Specifies the device to send authentication failure notifications.

Device Bootup: Specifies the device to send bootup notifications.

Port Link Up/Link Down: Specifies the device to send notifications when port linkup or link down.

RSTP Port State Change: Specifies the device to send notifications when RSTP port state changes.

Firmware Upgrade State: Specifies the device to send notifications when firmware upgrades.

Duplicate IP Detected: Specifies the device to send notifications when duplicate IP were detected.

SNMP > SNMP > SNMP User

This page is used to maintain the SNMP user table for the use of SNMPv3. SNMPv3 allows or restricts users using the MIB OID, and also encrypts the SNMP messages sent out between users and Switch.

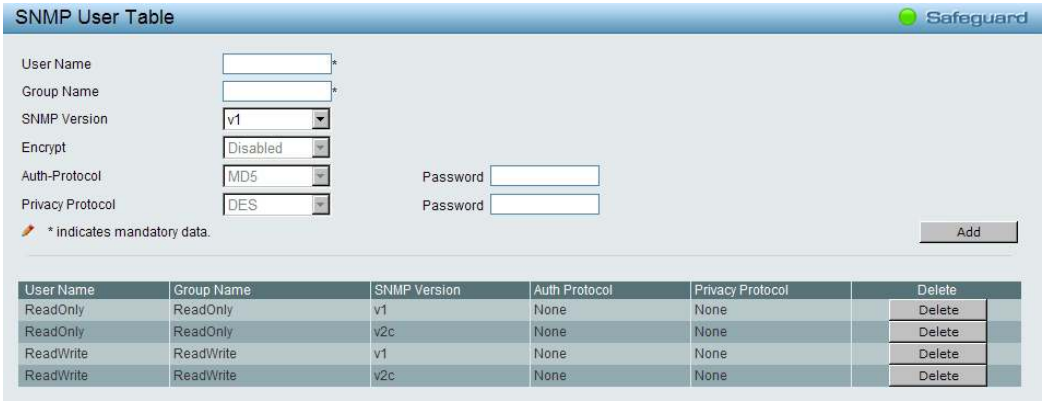


Figure 5.121 – SNMP > SNMP > SNMP User

User Name: Enter a SNMP user name of up to 32 characters.

Group Name: Specify the SNMP group of the SNMP user.

SNMP Version: Specify the SNMP version of the user. Only SNMPv3 encrypts the messages.

Auth-Protocol/Password: Specify either HMAC-MD5-96 or HMAC-SHA to be the authentication protocol. Enter a password for SNMPv3 encryption in the right column.

Priv-Protocol/Password: Specify either **no authorization** or **DES 56-bit encryption** and then enter a password for SNMPv3 encryption in the right column.

Click **Add** to create a new SNMP user account, and click **Delete** to remove any existing data.

SNMP > SNMP > SNMP Group

The SNMP Group page is used to maintain the SNMP Group Table associating to the users in SNMP User Table. SNMPv3 can control MIB access policy, security policy for a user group directly.

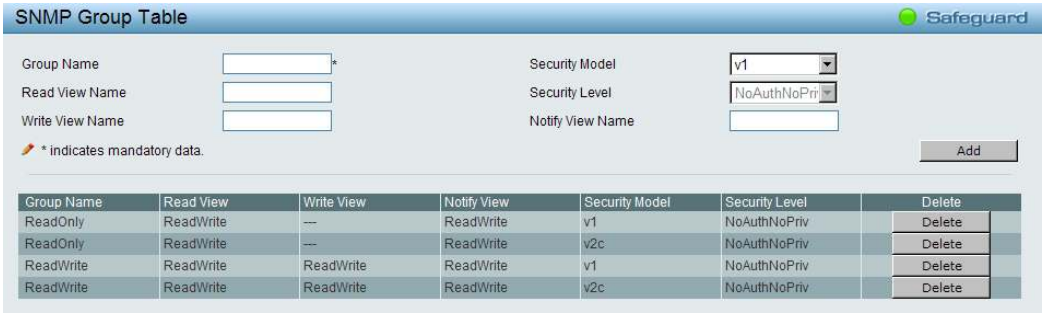

SNMP Group Table
Safeguard
Group Name
Read View Name
Write View Name
Security Model
Security Level
Notify View Name
v1
NoAuthNoPri
* indicates mandatory data.
Add
Group Name | Read View | Write View | Notify View | Security Model | Security Level | Delete
ReadOnly | ReadWrite | --- | ReadWrite | v1 | NoAuthNoPriv | Delete
ReadOnly | ReadWrite | --- | ReadWrite | v2c | NoAuthNoPriv | Delete
ReadWrite | ReadWrite | ReadWrite | ReadWrite | v1 | NoAuthNoPriv | Delete
ReadWrite | ReadWrite | ReadWrite | ReadWrite | v2c | NoAuthNoPriv | Delete

Figure 5.122 – SNMP > SNMP > SNMP Group

Group Name: Specify the SNMP user group of up to 32 characters.

Read View Name: Specify a SNMP group name for users that are allowed SNMP read privileges to the Switch's SNMP agent.

Write View Name: Specify a SNMP group name for users that are allowed SNMP write privileges to the Switch's SNMP agent.

Security Model: Select the SNMP security model.

v1 - SNMPv1 does not support the security features.

v2c - SNMPv2 supports both centralized and distributed network management strategies. It includes improvements in the Structure of Management Information (SMI) and adds some security features.

v3 - SNMPv3 provides secure access to devices through a combination of authentication and encrypting packets over the network.

Security Level: This function is only available when you select SNMPv3 security level.

NoAuthNoPriv - No authorization and no encryption for packets sent between the Switch and SNMP manager.

AuthNoPriv - Authorization is required, but no encryption for packets sent between the Switch and SNMP manager.

AuthPriv – Both authorization and encryption are required for packets sent between the Switch and SNMP manger.

Notify View Name: Specify a SNMP group name for users that can receive SNMP trap messages generated by the Switch's SNMP agent.

SNMP > SNMP > SNMP View

The SNMP View page allows user to maintain SNMP views to community strings that define the MIB objects which can be accessed by a remote SNMP manager.

Figure 5.123 – SNMP > SNMP > SNMP View Table

View Name: Name of the view, up to 32 characters.

Subtree OID: The Object Identifier (OID) Subtree for the view. The OID identifies an object tree (MIB tree) that will be included or excluded from access by an SNMP manager.

OID Mask: The mask of the Subtree OID. 1 means this object number is concerned, 0 means do not concerned. For example 1.3.6.1.2.1.1 with mask 1.1.1.1.1.1.0 means 1.3.6.1.2.1.X.

View Type: Specify the configured OID is Included or Excluded that a SNMP manager can access.

Click **Add** to create a new view, **Delete** to remove an existing view.

SNMP > SNMP > SNMP Community

The SNMP Community page is used to maintain the SNMP community string of the switch. SNMP managers using the same community string are permitted to gain access to the Switch's SNMP agent.

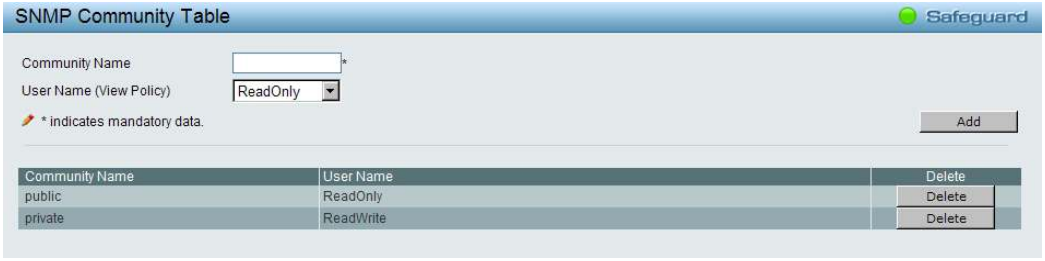


Figure 5.124 – SNMP > SNMP > SNMP Community

Community Name: Name of the community string

User Name (View Policy): Specify the read/write or read-only level permission for the MIB objects accessible to the SNMP community.

Click **Add** to create a new SNMP community, **Delete** to remove an existing community.

SNMP > SNMP > SNMP Host

The SNMP Host page is to configure the SNMP trap recipients.

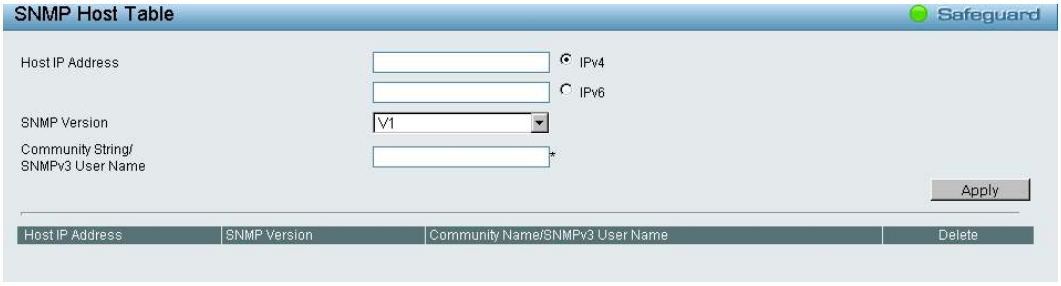


Figure 5.125 – SNMP > SNMP > SNMP Host

Host IP Address: Select IPv4 or IPv6 and specify the IP address of SNMP management host.

SNMP Version: Specify the SNMP version to be used to the management host.

Community String/SNMPv3 User Name: Specify the community string or SNMPv3 user name for the management host.

Click **Apply** to create a new SNMP host, **Delete** to remove an existing host.

SNMP > SNMP > SNMP Engine ID

The Engine ID is a unique identifier used to identify the SNMPv3 engine on the Switch.

Input the Engine ID then click **Apply** to apply the changes and click **Default** resets to default value.

Figure 5.126 – SNMP > SNMP > SNMP Engine ID

SNMP > RMON > RMON Global Settings

Users can enable and disable remote monitoring (RMON) status for the SNMP function on the Switch. In addition, RMON Rising and Falling Alarm Traps can be enabled and disabled. Click **Apply** to make effects.

Figure 5.127 – SNMP > RMON > RMON Global Settings

SNMP > RMON > RMON Statistics

The RMON Ethernet Statistics Configuration page displays the information of RMON Ethernet Statistics and allows the user to configure the settings.

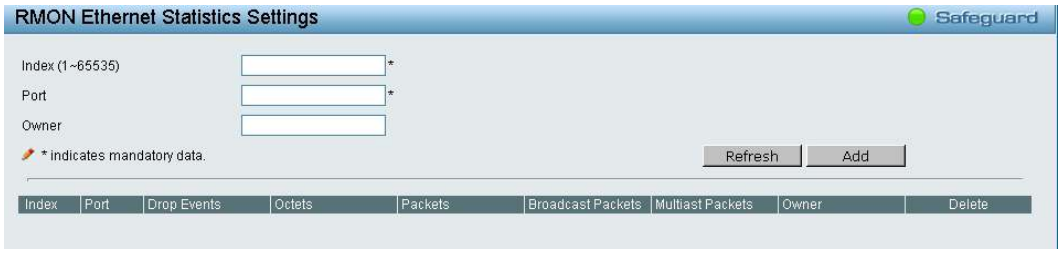


Figure 5.128 – SNMP > RMON > RMON Statistics

The RMON Ethernet Statistics Configuration contains the following fields:

Index (1 - 65535): Indicates the RMON Ethernet Statistics entry number.

Port: Specifies the port from which the RMON information was taken.

Owner: Displays the RMON station or user that requested the RMON information.

Click **Add** to make the configurations take effects or click to renew the details collected and displayed.

SNMP > RMON > RMON History

The RMON History Control Configuration page contains information about samples of data taken from ports. For example, the samples may include interface definitions or polling periods.

Figure 5.129 – SNMP > RMON > RMON History

The History Control Configuration contains the following fields:

Index (1 - 65535): Indicates the history control entry number.

Port: Specifies the port from which the RMON information was taken.

Buckets Requested (1 ~ 50): Specifies the number of buckets that the device saves.

Interval (1 ~ 3600): Indicates in seconds the time period that samplings are taken from the ports. The field range is *1-3600*. The default is *1800* seconds (equal to 30 minutes).

Owner: Displays the RMON station or user that requested the RMON information.

Click **Add** to make the configurations take effects.

SNMP > RMON > RMON Alarm

The RMON Alarm Configuration page allows the user to configure the network alarms. Network alarms occur when a network problem, or event, is detected.

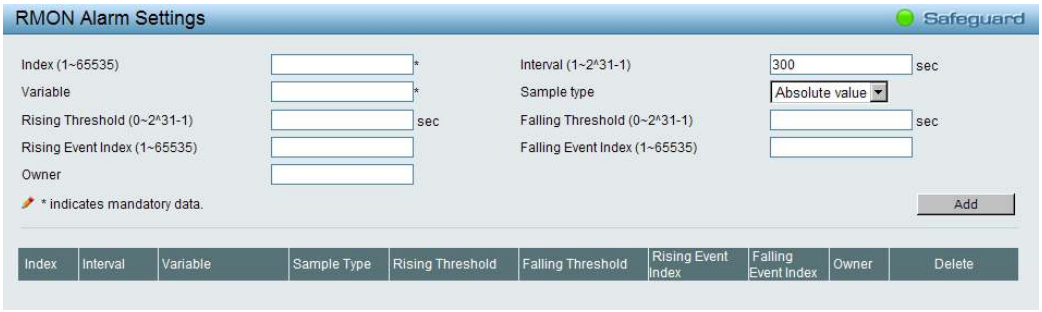


Figure 5.130 – SNMP > RMON > RMON Alarm

The configuration contains the following fields:

Index (1 - 65535): Indicates a specific alarm.

Variable: Specify the selected MIB variable value.

Rising Threshold (0 ~ 2^31-1): Displays the rising counter value that triggers the rising threshold alarm.

Rising Event Index (1 ~ 65535): Displays the event that triggers the specific alarm. The possible field values are user defined RMON events.

Owner: Displays the device or user that defined the alarm.

Interval (1 ~ 2^31-1): Defines the alarm interval time in seconds.

Sample type: Defines the sampling method for the selected variable and comparing the value against the thresholds. The possible field values are:

Delta value – Subtracts the last sampled value from the current value. The difference in the values is compared to the threshold.

Absolute value – Compares the values directly with the thresholds at the end of the sampling interval.

Falling Threshold (0 ~ 2^31-1): Displays the falling counter value that triggers the falling threshold alarm.

Falling Event Index (1 ~ 65535): Displays the event that triggers the specific alarm. The possible field values are user defined RMON events.

Click **Add** to make the configurations take effects.

SNMP > RMON > RMON Event

The RMON Event Configuration page contains fields for defining, modifying and viewing RMON events statistics.

Figure 5.131 – SNMP > RMON > RMON Event

The RMON Events Page contains the following fields:

Index (1~ 65535): Displays the event.

Description: Specifies the user-defined event description.

Type: Specifies the event type. The possible values are:

None – Indicates that no event occurred.

Log – Indicates that the event is a log entry.

SNMP Trap – Indicates that the event is a trap.

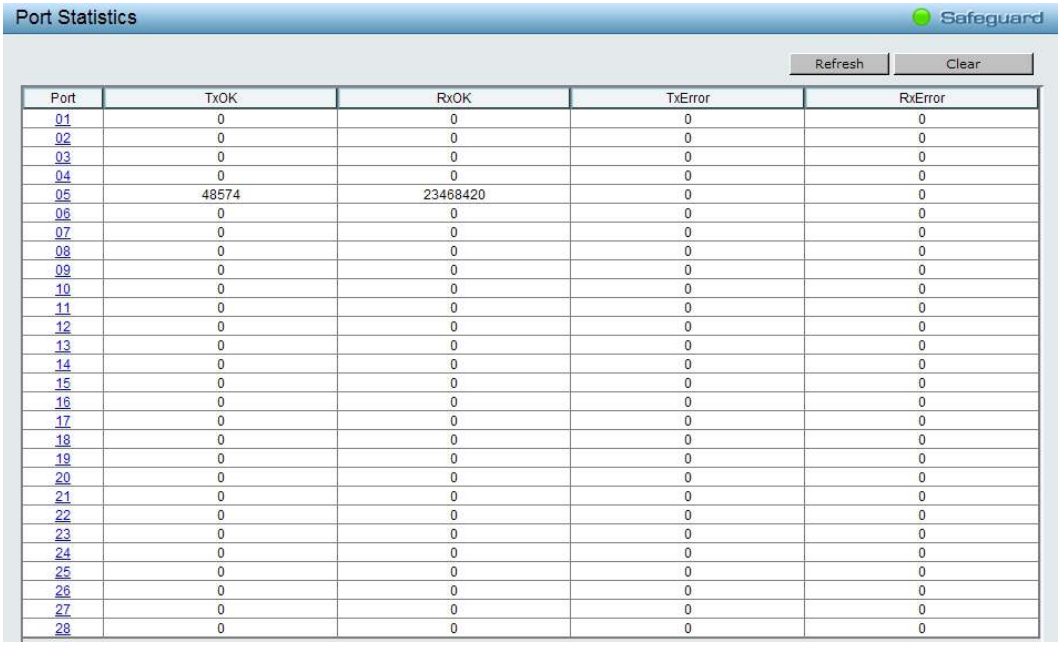
Log and Trap – Indicates that the event is both a log entry and a trap.

Community: Specifies the community to which the event belongs.

Owner: Specifies the time that the event occurred.
Click **Add** to add a new RMON event.

Monitoring > Port Statistics

The Port Statistics screen displays the status of each port packet count.



Port	TxOK	RxOK	TxError	RxError
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	48574	23468420	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0

Figure 5.132 – Monitoring > Port Statistics

Refresh: Renews the details collected and displayed.
Clear: To reset the details displayed.
TxOK: Number of packets transmitted successfully.
RxOK: Number of packets received successfully.
TxError: Number of transmitted packets resulting in error.
RxError: Number of received packets resulting in error.

To view the statistics of individual ports, click one of the linked port numbers for details.

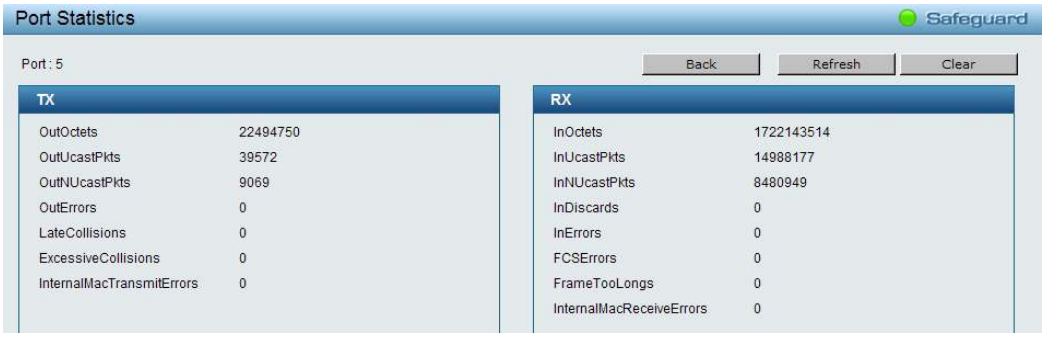


Figure 5.133 – Monitoring > Port Statistics

Back: Go back to the Statistics main page.
Refresh: To renew the details collected and displayed.
Clear: To reset the details displayed.

Monitoring > Cable Diagnostics

The Cable Diagnostics is designed primarily for administrators and customer service representatives to examine the copper cable quality. It rapidly determines the type of cable errors occurred in the cable.

Select a port and then click the **Test Now** button to start the diagnosis.

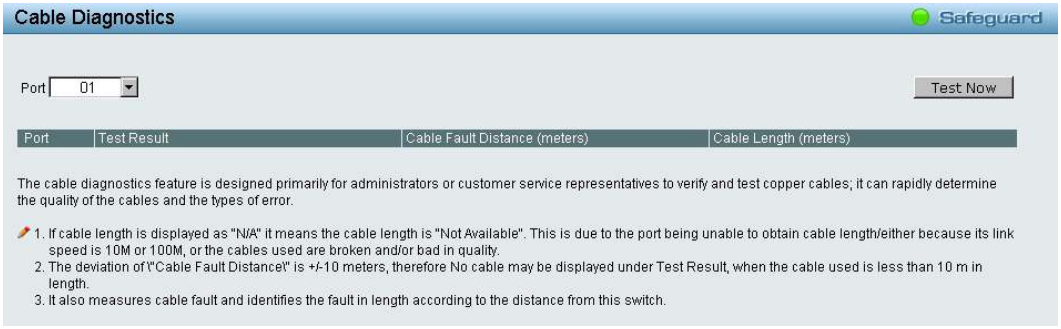

Cable Diagnostics
Safeguard
Port 01
Test Now
Port
Test Result
Cable Fault Distance (meters)
Cable Length (meters)
The cable diagnostics feature is designed primarily for administrators or customer service representatives to verify and test copper cables; it can rapidly determine the quality of the cables and the types of error.
1. If cable length is displayed as "N/A" it means the cable length is "Not Available". This is due to the port being unable to obtain cable length/either because its link speed is 10M or 100M, or the cables used are broken and/or bad in quality.
2. The deviation of \"Cable Fault Distance\" is +/-10 meters, therefore No cable may be displayed under Test Result, when the cable used is less than 10 m in length.
3. It also measures cable fault and identifies the fault in length according to the distance from this switch.

Figure 5.134 – Monitoring > Cable Diagnostic

Test Result: The description of the cable diagnostic results.

- **OK** means the cable is good for the connection.
- **Short in Cable** means the wires of the RJ45 cable may be in contact somewhere.
- **Open in Cable** means the wires of RJ45 cable may be broken, or the other end of the cable is simply disconnected.
- **Test Failed** means some other errors occurred during cable diagnostics. Please select the same port and test again.

Cable Fault Distance (meters): Indicates the distance of the cable fault from the Switch port, if the cable is less than 2 meters, it will show “No Cable”.

Cable Length (meter): If the test result shows OK, then cable length will be indicated for the total length of the cable. The cable lengths are categorized into four types: <50 meters, 50~80 meters, 80~100 meters and >100 meters.

NOTE: Cable length detection is effective on Gigabit ports only.

NOTE: Please be sure that Power Saving feature is disabled before enabling Cable Diagnostics function.

Monitoring > System Log

The System Log page provides information about system logs, including information when the device was booted, how the ports are operating, when users logged in, when sessions timed out, as well as other system information.

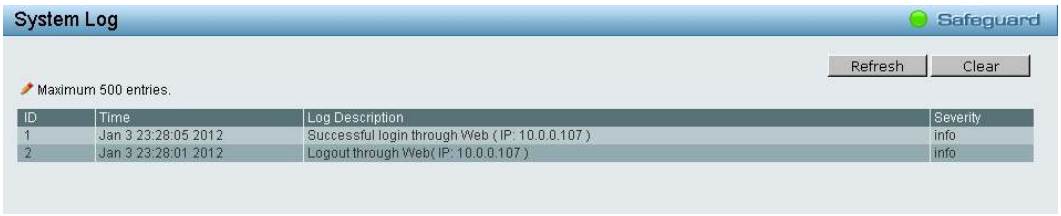


Figure 5.135 – Monitoring > System Log

ID: Displays an incremented counter of the System Log entry. The Maximum entries are 500.

Time: Displays the time in days, hours, and minutes the log was entered.

Log Description: Displays the description event recorded.

Severity: Displays a severity level of the event recorded.

Click **Refresh** to renew the page, and click **Clear** to clean out all log entries.

6 Command Line Interface

The D-Link SmartPro Switch allows a computer or terminal to perform some basic monitoring and configuration tasks by using the Command Line Interface (CLI) via TELNET protocol.

To connect a switch via TELNET:

1. Make sure the network connection between the switch and PC is active.
2. To connect, launch any terminal software like ***HyperTerminal*** in Microsoft Windows, or just use the command prompt by typing the command *telnet* followed by the switch IP address, eg. *telnet 10.90.90.90*.
3. The logon prompt will appear.

Logging on to the Command Line Interface:

Enter your User Name and Password to log in. The default user name and password is **admin**. Note that the user name and password are case-sensitive. Press **Enter** in both the Username and Password fields. The command prompt will appear as shown below **(DGS-1500-28>):**

```
DGS-1500-28 login: admin
Password:


DGS-1500-28>
```

Figure 6.1 – Command Prompt

The user session is automatically terminated if idle for the login timeout period. The default login timeout period is 5 minutes. To change the login timeout session, please refer to chapter 5.

CLI Commands:

The Basic Switch commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command Syntax	Description of Usage
?	The ? Displays a list of CLI commands on the device.
download { firmware_fromTFTP | cfg_fromTFTP} {<ipaddr> | <ipv6addr>} <path_filename>	Download the firmware/configuration from TFTP server to switch.
upload { firmware_toTFTP | cfg_toTFTP} {<ipaddr> | <ipv6addr>} <path_filename>	Upload the firmware or configuration from switch to TFTP server.
config ipif <ipif_name> [ipaddress <ip-address> <subnet-mask> gateway <gw-address> | dhcp | bootp] **config ipif <ipif_name> <ipv6 ipv6address <ipv6networkaddr> | dhcpv6_client <enable | disable>**	Configure IP setting of interface.
logout	Logout from this session.
ping <ip_addr>	This command checks if another computer is on the network and listens for connections.The terminal interface sends five pings to the target station.
ping6 <ipv6addr>	This command checks if another computer is on the network and listens for connections.The terminal interface sends five pings to the target station.
reboot	This command reboots the system. All network connections are terminated and the boot code executes.
reset config	Reset the device to factory default

show ipif [<ipif_name>]	Displays the current IPv4 and IPv6 address of the interface.
show switch	Show system information.
config account admin password <passwd>	Configure password.
save	Save configuration.
debug info	Displays Debug Table.

Each command is listed in detail, as follows:

?	
Purpose	To display a list of commands.
Syntax	?
Description	The ? command displays a list of commands of the switch.
Parameters	None.
Restrictions	None.

Example usage:

To display a list of commands of the switch:

```
DGS-1500-28> ?
USEREXEC commands :
  config account admin password <passwd>
  config ipif <ipif_name> { ipaddress <ip-address> <subnet-mask> gateway <gw-address> | dhcp | bootp }
  config ipif <ipif_name> { ipv6 ipv6address <ipv6networkaddr> | dhcpv6_client { enable | disable}}
  debug info
  download { firmware_fromTFTP | cfg_fromTFTP} {<ipaddr>|<ipv6addr>} <path_filename>
  logout
  ping <ip_addr>
  ping6 <ipv6addr>
  reboot
  reset config
  save
  show ipif [<ipif_name>]
  show switch
  upload { firmware_toTFTP | cfg_toTFTP} {<ipaddr>|<ipv6addr>} <path_filename>
DGS-1500-28>
```

download	
Purpose	To download and install a firmware, boot, or switch configuration file from a TFTP server.
Syntax	**download { firmware_fromTFTP | cfg_fromTFTP} {<ipaddr> |**

	<ipv6addr>} <path_filename>
Description	The download command downloads a firmware, boot, or switch configuration file from a TFTP server.
Parameters	*firmware_fromTFTP* − Download and install new firmware on the Switch from a TFTP server. *cfg_fromTFTP* − Download a switch configuration file from a TFTP server. <*ipaddr*> | <*ipv6addr*> − The IP or IPv6 address of the TFTP server. <*path_filename*> − The path filename of the firmware or switch configuration file on the TFTP server. You need to specify the DOS path if the file is not at the root directory of the TFTP server.
Restrictions	None.

Example usage:

To download a firmware file:

```
DGS-1500-28> download firmware_fromTFTP 1.1.1.23 1\dgs_1500-10032.ros

01–Jan–2000 01:19:48 %COPY–I–FILECPY: Files Copy – source URL tftp://1.1.1.23 /1\
dgs_1500—10032.ros destination URL Unit all flash://image
!!!
```

	TFTP server.
Syntax	**upload { firmware_toTFTP | cfg_toTFTP} {<ipaddr> | <ipv6addr>} <path_filename>**
Description	The upload command uploads the Switch's current settings to a TFTP server.
Parameters	*firmware_toTFTP* − Upload the firmware on the Switch from a TFTP server. *cfg_toTFTP* − Specifies that the Switch's current settings will be uploaded to the TFTP server. <*ipaddr*> | <*ipv6addr*> − The IP or IPv6 address of the TFTP server. <*path_filename*> − The path filename of the firmware or switch configuration file on the TFTP server. You need to specify the DOS path if the file is not at the root directory of the TFTP server.
Restrictions	None.

Example usage:

To upload a firmware file:

```
DGS-1500-28>upload firmware_toTFTP 1.1.1.23 1\running—config

01–Jan–2000 01:26:11 %COPY–I–FILECPY: Files Copy – source URL running–config destination URL tftp://1.1.1.23/1\running–config

…..01–Jan–2000 01:26:16 %COPY–W–TRAP: The copy operation was completed success fully

!

158 bytes copied in 00:00:05 [hh:mm:ss]

DGS-1500-28>
```

config ipif

Purpose	To configure the System IP interface.
Syntax	**config ipif <ipif_name> [ipaddress <ip-address> <subnet-mask> gateway <gw-address> | dhcp | bootp]** **config ipif <ipif_name> <ipv6 ipv6address <ipv6networkaddr> | dhcpv6_client <enable | disable>**
Description	The config ipif system command configures the System IP interface on the Switch.
Parameters	*ipif_name* − Specifies the name of ipif setting. *ipaddress* <*ip-address*> <*subnet-mask*> − The IP address and subnet mask to be created. Users need to specify the address and mask information using the traditional format (for example,10.1.2.3/255.0.0.0) *gateway* <*gw-address*> − The IP address of the router or gateway. *dhcp* − Allows the selection of the DHCP protocol for the assignment of an IP address to the Switch's System IP interface. bootp − The BOOTP protocol allows IP addresses, network masks, and default gateways to be assigned by a central BOOTP server.

	ipv6 ipv6address <ipv6networkaddr> − Use this parameter to statically assign an IPv6address to this interface. This address should define a host address and a network prefix length. Multiple IPv6 addresses can be configured for a single IP interface. Ex: 3ffe:501:ffff:100::1/64. The /64 represents the prefix length of the IPv6 addresses. *dhcpv6_client <enable | disable>* − Specify the DHCPv6 client to be disabled or enabled.
Restrictions	None.

Example usage:

To configure the IP interface System:

```
DGS-1500-28> config ipif System ipaddress 10.48.74.122/8


Success.

DGS-1500-28>
```

logout

Purpose	To log out a user from the Switch's console.
Syntax	**logout**
Description	The logout command terminates the current user's session on the Switch's console.
Parameters	None.
Restrictions	None.

Example usage:

To terminate the current user's console session:

```
DGS-1500-28> logout
```

NOTE: Save your configuration changes before logging out.

ping

Purpose	To test the connectivity between network devices.
Syntax	**ping <ip_addr>**
Description	The ping command checks if another IP address is reachable on the network. You can ping the IPv4 address connected to through the managed VLAN (VLAN 1 by default), as long as there is a physical path between the switch and the target IPv4 equipment. By default, Switch sends five pings to the target IP.
Parameters	*<ip_addr>* - The IPv4 address of the host.
Restrictions	None.

Example usage:

To ping the IP address 10.90.90.91:

```
DGS-1500-28> ping 10.90.90.91

Reply Received From :10.90.90.91, TimeTaken : 20 msecs
Reply Received From :10.90.90.91, TimeTaken : 20 msecs
Reply Received From :10.90.90.91, TimeTaken : 20 msecs


--- 10.90.90.91 Ping Statistics ---
3 Packets Transmitted, 3 Packets Received, 0% Packets Loss

DGS-1500-28>
```

ping6

Purpose	To test the connectivity between IPv6 ready network devices.
Syntax	**ping6 <ipv6addr>**
Description	The ping6 command checks if another IPv6 address is reachable on the network. You can ping the IPv6 address connected to through the managed VLAN (VLAN 1 by default), as long as there is a physical path between the switch and the target IPv6 equipment. By default, Switch sends five pings to the target IP.
Parameters	*<ipv6addr>* - Specifies the IPv6 address of the host.
Restrictions	None.

Example usage:

To ping the IPv6 address 2009::280:C8FF:FE3C:5C8A:

```
DGS-1500-28> ping6  2009::280:C8FF:FE3C:5C8A

Reply Received From : 2009::280:C8FF:FE3C:5C8A, TimeTaken : 20 msecs
Reply Received From : 2009::280:C8FF:FE3C:5C8A, TimeTaken : 20 msecs
Reply Received From : 2009::280:C8FF:FE3C:5C8A, TimeTaken : 20 msecs


--- 2009::280:C8FF:FE3C:5C8A Ping Statistics ---
3 Packets Transmitted, 3 Packets Received, 0% Packets Loss

DGS-1500-28>
```

reboot

Purpose	To reboot the Switch. If the Switch is a member of a stack, it may be rebooted individually, without affecting the other members of the stack.
Syntax	**reboot**
Description	The reboot command reboots the system. All network connections are terminated and the boot code executes.
Parameters	None.
Restrictions	None.

Example usage:

To restart the Switch:

```
DGS-1500-28> reboot

% Device will reboot, please wait a few minutes to re-login.

DGS-1500-28>
```

reset config

Purpose	To reset the Switch to the factory default settings.
Syntax	**reset config**
Description	All configurations will be reset to the default settings.
Parameters	None.
Restrictions	None.

Example usage:

To restore all of the Switch's parameters to their default values:

```
DGS-1500-28> reset config

% Device will reboot after reset configuration successfully.


DGS-1500-28>
```

show ipif

Purpose	To display the configuration of an IP interface on the Switch.
Syntax	**show ipif [<ipif_name>]**
Description	The show ipif command displays the current IP address of the switch.
Parameters	***<ipif_name>*** - Specify the name to be displayed.
Restrictions	None.

Example usage:

To display IP interface settings:

```
DGS-1500-28> show ipif

IP Setting Mode          : Static
Interface name           : System
Interface VLAN Name      : default
IP Address               : 10.90.90.90
Subnet Mask              : 255.255.255.0
Default Gateway          : 0.0.0.0


DGS-1500-28>
```

show switch	
Purpose	To display information about the Switch.
Syntax	**show switch**
Description	The show switch command displays the status of the switch.
Parameters	None.
Restrictions	None.

Example usage:

To display the switch information:

```
DGS-1500-28> show switch
System Name          :
System Contact       :
System Location      :
System up time       : 0 days, 6 hrs, 32 min, 17 secs
System Time          : 01/01/2009 06:32:19
System hardware version    : A1
System firmware version    : 1.00.001
System boot version        : 1.00.000
System Protocol version    : 2.001.004
System serial number       : LAB1500280022
MAC Address          : 00-18-E7-48-85-50

DGS-1500-28>
```

config account admin password	
Purpose	To display the configuration of an IP interface on the Switch.
Syntax	config account admin password
Description	The config account admin password command sets the administrator password.
Parameters	*<passwd>* − The new password of the administrator.
Restrictions	None.

Example usage:

To configure the account admin password:

```
DGS-1500-28> config account admin password 1234

DGS-1500-28>
```

save	
Purpose	To save changes in the Switch's configuration to non-volatile RAM.
Syntax	save

Description	The save command saves the configuration changes to the memory.
Parameters	None.
Restrictions	None.

Example usage:

To save the Switch's current configuration to non-volatile RAM:

```
DGS-1500-28> save
Building configuration ...
[OK]

DGS-1500-28>
```

debug info

Purpose	To display the ARP table and MAC FDB information of the Switch.
Syntax	debug info
Description	The debut info command displays the ARP table and MAC FDB of the Switch.
Parameters	None.
Restrictions	None.

Example usage:

To display the ARP table and MAC FDB information of the Switch:

```
DGS-1500-28> debug info
% segmentation fault log file:

File doesn't exist !!!
% ARP table :

Address         Hardware Address   Type    Interface   Mapping
------- ------  ----------- ----------  ------  ----------  ----------
10.90.90.90     00:18:8b:bf:75:30   ARPA  vlan1     Static
10.90.90.98     00:19:5b:14:3d:c4   ARPA   vlan1     Dynamic
10.255.255.255  ff:ff:ff:ff:ff:ff          ARPA   vlan1     Static

% MAC table :

Vlan   Mac Address        Type      Ports
------  -------------------       --------     -------
1       00:00:00:00:00:26  Learnt  Gi0/7
```

```
Total Mac Addresses displayed: 1


DGS-1500-28>
```

Appendix A - Technical Specifications

Hardware Specifications

Key Components / Performance

- Switching Capacity:
  - DGS-1500-20: 40Gbps
  - DGS-1500-28: 56Gbps
  - DGS-1500-28P: 56Gbps
  - DGS-1500-52: 104Gbps
- Max. Forwarding Rate
  - DGS-1500-20: 29.8Mpps
  - DGS-1500-28: 41.7Mpps
  - DGS-1500-28P: 41.7Mpps
  - DGS-1500-52: 77.4Mpps
- Forwarding Mode: Store and Forward
- Packet Buffer memory:
  - DGS-1500-20: 1MBytes
  - DGS-1500-28: 1Mbytes
  - DGS-1500-28P: 1Mbytes
  - DGS-1500-52: 1MBytes
- DDRII for CPU: 128M Bytes
- Flash Memory: 16M Bytes

Port Functions

- 1000Base-T ports compliant with the following standards:
  - IEEE 802.3
  - IEEE 802.3u
  - IEEE 802.3ab
  - IEEE 802.3af (DGS-1500-28P only)
  - IEEE 802.3at (DGS-1500-28P only)
  - Supports Half/Full-Duplex operations
  - IEEE 802.3x Flow Control support for Full-Duplex mode
  - Auto MDI/MDIX
  - IEEE802.3af Power of Ethernet on Port 1~Port 24 GE ports
  - IEEE802.3at Power of Ethernet on Port 1~Port 24 GE ports
- SFP ports compliant with the following standards:
  - IEEE 802.3z
  - Supports Full-Duplex operations
- SFP transceivers supported
  - DEM-310GT (1000BASE-LX, 10km)
  - DEM-311GT (1000BASE-SX, 550m)
  - DEM-314GT (1000BASE-LH, 50km)
  - DEM-315GT (1000BASE-ZX, 80km)
  - DEM-312GT2 (1000BASE-SX, 2km)

  WDM Transceivers Supported:
  - DEM-330T/R (Gigabit WDM transceiver, Single-Mode 10km)
  - DEM-331T/R (Gigabit WDM transceiver, Single-Mode 40km

Physical & Environment

- AC input, 100~240 VAC, 50/60Hz, internal universal power supply
- Acoustic Value:
  - DGS-1500-20: 0dB (Fan-less)
  - DGS-1500-28: 0dB (Fan-less)
  - DGS-1500-28P: 2 Smart Fan. High speed: 55.3dB(A); low speed: 49.5 dB(A)
  - DGS-1500-52: 47.1dB (Smart Fan)
- Operation Temperature -5~50℃
- Storage Temperature -20~70℃
- Operation Humidity: 0%~95% RH
- Storage Humidity: 0%~95% RH

RPS Support

DPS-700: Max. power budget 589W

Emission (EMI) Certifications

- FCC class A
- CE Class A
- VCCI Class A
- IC Class A
- BSMI Class A
- CCC Class A

Safety Certifications

- cUL, LVD, CE

Features

L2 Features

- Supports up to 16K MAC address
- Jumbo frame: Supports up to 10,000 bytes
- IGMP snooping: Supports 256 multicast group
- 802.1D Spanning Tree
- 802.1s MSTP
- 802.1w Rapid Spanning Tree
- Loopback Detection
- 802.3ad Link Aggregation:
  - DGS-1500-20: up to 10 groups per device and 8 ports per group
  - DGS-1500-28: up to 14 groups per device and 8 ports per group
  - DGS-1500-28P: up to 14 groups per device and 8 ports per group
  - DGS-1500-52: up to 26 groups per device and 8 ports per group

- Port mirroring

L3 Features

- ARP:
  - Max 1K ARP entries
  - Support 64 static ARP
  - Support Gratuitous ARP
- Support 4 IP interfaces
- Support IPv4 address 0.0.0.0 to prevent occupied IP address in the network
- Support IPv6 Neighbor Discovery:
  - Max 512 ND entries
  - Support up to 64 static ND entries
- Max. 32 IPv4 and 16 IPv6 static route entries
- Support secondary route
- Max. 128 IPv4 and 64 IPv6 host route
- Stackability:
  - Support D-Link Single IP Management
  - Use single IP to manage the virtual stack with up to 32 D-Link switches

D-Link Green Technology

- IEEE 802.3az Energy-Efficient Ethernet (EEE):

  It is the first standard in the history of Ethernet to address proactive reduction in energy consumption for networked devices. The IEEE 802.3 EEE standard defines mechanisms and protocols intended to reduce the energy consumption of network links during periods of low utilization, by transitioning interfaces into a low-power state without interrupting the network connection.
- Power Saving Technology:
  - Power saving by link status:

    If there is no link on a port, such as when there is no computer connected to the port or the connected computer is powered off, D-Link's Green Technology will enter a "sleep mode", drastically reducing power used for that port.
  - Power saving by cable length: 0~20m, 21~100m.

    D-Link's Green Technology detects the length of connected Ethernet cable and adjusts power usage accordingly without affecting performance. This way, a port connected to a 20m cable only uses as much power as it needs, instead of using full power, which is only needed for 100m cables.

VLAN

- 802.1Q VLAN standard (VLAN Tagging)
- Up to 256 dynamic VLAN groups
- Asymmetric VLAN
- Auto-Voice VLAN
- Auto Surveillance VLAN

QoS (Quality of Service)

- Be able to classify packets according to follow contents:
  - Switch port
  - 802.1p priority
  - VID
  - MAC address
  - IP address
  - DSCP
  - TOS
  - Protocol type
- - TCP/UDP port number Up to 4 queues per port
- Supports Strict / WRR mode in queue handling
- Bandwidth Control

AAA

- 802.1X Local/RADIUS database
- Supports IPv6 RADIUS server
- 802.1X port-based access control
- Support EAP, OTP, TLS, TTLS and PEAP
- Support MD5 authentication
- Support 802.1X session timeout attribute

ACL

- Max 50 ingress ACL profile, 200 ingress ACL rules(DGS-1500-20/28), 450 ingress ACL rules(DGS-1500-52)
- Each rule can be associated to a single port, multiple ports (Only for DGS-1500-20/28)
- Support different ACL policy packet contents:
  - MAC address
  - Ethernet Type
  - IPv4 address
  - IPv6 address
  - ICMP
  - IGMP
  - TCP/UDP port number
  - 802.1p
  - DSCP
  - IPv6 traffic class

Security

- Port Security: Support 64 MACs per port
- IP and MAC ACL
- Broadcast Storm Control
- D-Link Safeguard Engine
- ARP Spoofing Prevention: Maximum 64 entries

- DHCP Server Screening over IPv4 or IPv6 : Maximum 5 entries
- SSL: Support v1/v2/v3
- SSH over IPv4 or IPv6: Support v2
- Support DHCP Snooping
- Smart Binding

  - Supports ARP packet Inspection as default, ARP and IPv4 packet Inspection as option.

  - Supports IPv4 DHCP Snooping

Management

- Web-based GUI (IPv6 support)
- SmartConsole Utility
- D-Link compact CLI (Supports IPv6 commands)
- Telnet Server: Max. 4 connections (IPv6 support)
- TFTP Client over IPv4 or IPv6
- SNMP v1/2c/3 over IPv4 or IPv6
- SNMP Trap, Trap to SmartConsole Utility
- DHCP client over IPv4 or IPv6
- RMON v1/v2
- SysLog Host: Maximum 500 entries
- Trap setting for destination IP, system events, fiber port events, twisted-pair port events
- Web-based configuration backup / restoration
- Web-based firmware backup/restore
- Firmware upgrade using SmartConsole Utility & Web-based management
- Reset, Reboot

D-Link
Building Networks for People